

awis

A close-up portrait of Dr. Marie A. Bernard, an older Black woman with short, curly grey hair. She is wearing glasses, pearl earrings, a blue scarf, and a dark blue jacket. She is smiling and has a microphone clipped to her jacket. The background is blurred with warm, bokeh lights.

association
for women
in science

03

fall 2021
volume 53

Dr. Marie A. Bernard shares

Leadership Lessons

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That is the question**

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Harnessing the Science of Diversity: A Conversation with Dr. Marie A. Bernard

By Jenna Jablonski, Guest Writer

Marie A. Bernard, MD, is the National Institutes of Health (NIH) [*Chief Officer for Scientific Workforce Diversity*](#) (COSWD). As COSWD, she leads the NIH's program to build the science of workforce diversity, to disseminate that science, and to act on the evidence. Dr. Bernard also co-leads NIH's UNITE Initiative to end structural racism. I spoke with Dr. Bernard about her vision for diversity, equity, and inclusion in science and about how she's using her unique role to catalyze institutional culture change.



Before becoming the NIH's Acting COSWD in October 2020, and then being formally selected for the position in May 2021, you spent your academic career working in geriatric medicine. What about your previous experiences compelled you to take on your current role?

Having a diverse group of people around me has always been important. I know that I have a different point of view as a result of my personal experiences as a woman and as a woman of color. The literature shows, and my own experience confirms, that having diverse perspectives is important. That's what I have been about my whole career, quite honestly.

In geriatrics, diverse viewpoints and perspectives are built in, because you work in an interdisciplinary fashion. It is a field of medicine that probably has more than average racial/ethnic and gender diversity. So, supporting and enhancing diversity has been natural for me. Making sure that there are more people at the table has been at the core of my work throughout my career.

What do you see as the most urgent issue facing the biomedical research enterprise today, in terms of diversity, equity, and inclusion?

I think the most urgent issue is making sure we take advantage of the full spectrum of talent that's out there. When you look at the demographics of this country, the people who are getting their associate's and bachelor's degrees are really diverse. There are as many women as men, and more women than men in some fields and institutions; and there is strong racial/ethnic group diversity. But once you climb the academic ranks, that diversity is not reflected at the top. And the people at the top craft the agenda going forward. Therefore, we need to pay attention to the things that lead people to leave scientific careers. If our country is going to maintain its leadership in science, we need the creativity and innovation that comes from having diverse perspectives.

How does this urgent issue fit into your vision as COSWD?

It fits perfectly. This is a unique role —the Chief Officer for Scientific Workforce Diversity reports directly to the NIH Director. The team that I lead is in a science organization, so we have to be very evidence based. We also know that



Our job is to build the science of scientific workforce diversity, to disseminate that science, and to act on the evidence.

we need a comprehensive approach to be successful—you can't just bring more people from underrepresented groups to the table and not do anything to support them.

Our job is to build the science of scientific workforce diversity, to disseminate that science, and to act on the evidence. We're building the science by using the NIH as the test bed for various initiatives. As for dissemination, we're developing a seminar series on scientific workforce diversity and developing workshops that the scientific community will be invited to.

Quite frankly, the business sector is way ahead of us in gathering data to demonstrate the benefits of workforce diversity. In the biomedical sciences, we have some data, and we can clearly see opportunities lost when you don't take advantage of everyone who's out there. But under my leadership, I hope that we will be able to build further data.

We are also going to pilot a variety of new approaches, both within my office and in my role as co-chair of the NIH [UNITE Initiative](#), which was established to identify and address structural racism within NIH-supported programs and within the greater scientific community.

Racial disparities in NIH grant funding are a persistent issue, first documented in the groundbreaking 2011 report by economist Dr. Donna K. Ginther and her research team. The NIH created the COSWD position in 2014 in the wake of this report. What progress has been made since then, in terms of these funding disparities?

The NIH has launched a variety of initiatives to address these funding disparities. In 2014, as it was establishing the COSWD position, the NIH created the Diversity Program Consortium (DPC) to help fill the ranks of future scientists through outreach to settings that served under-resourced communities, including Historically Black Colleges and Universities, Hispanic-Serving Institutions, Tribal Colleges and Universities, and other minority-serving institutions. A component of the DPC, the NIH's National Research Mentoring Network, has helped scientists from underrepresented groups successfully apply for R01 grants. Additionally, the NIH has developed numerous other initiatives aimed at fostering success of scientists from underrepresented groups.

The data show a slow but progressive narrowing of the funding gap reported by Ginther and colleagues.

From 2013 through 2020, we can see that the numbers of African American and Black applicants have almost doubled, and the success rates have also increased by almost double. But there's still a gap. The thing that is of greatest concern is that the overall numbers are still very small. This is an issue not only for African Americans and Blacks but also for American Indians and Alaska Natives, Native Hawaiians, and Pacific Islanders. There is a higher success rate among Hispanics/Latinos, but their representation among funded scientists is not proportional to their representation in the general population. So, there's a lot of work for us still to do.

Although we are making progress, it is not occurring as rapidly as I would like. We need to make sure that the pathway for future scientists is robust, that we have removed barriers and put in as many facilitators as possible. That is part of the reason I am energized to not only serve as COSWD but also co-chair of the NIH UNITE Initiative, which is focusing on what we can do to remove racial/ethnic barriers.

You led the NIH's Women of Color Committee for almost a decade, working to increase the visibility of women scientists at the NIH and beyond. What is your biggest takeaway from this experience?

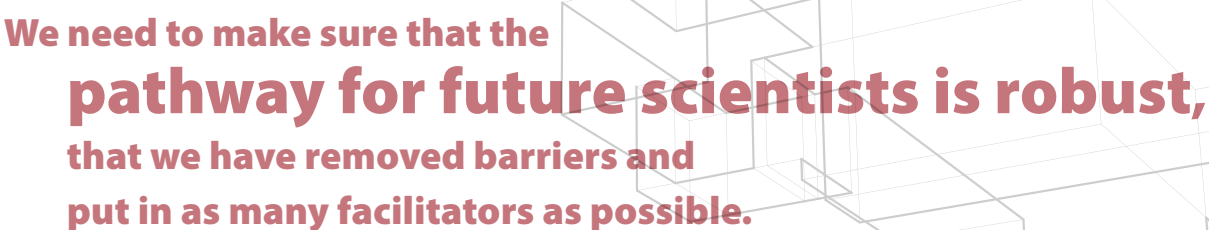
Yes, under my leadership we worked to systematically identify and nominate women of color scientists for prestigious awards and lectureships. It was wonderful meeting so many highly qualified women and hearing of their career journeys. There were some recurring patterns: every one of these women had a really vibrant foundation—they had support from a mother, a father, or an entire family, telling them, "You can do it." Every one of them had mentors and sponsors, who believed in them early on and who gave them opportunities. These successful women scientists all did the same sort of thing my mother used to tell me to do: "Put your head down and get your work done. Don't let other things be distractions."

One of the honors for which we nominated these women was the NIH Wednesday Afternoon Lecture Series, our premier lecture series. They would come and talk to the Women of Color Committee that morning, meet with various leaders at NIH throughout the day, and then give their lecture in the afternoon. They were just outstanding. It was a wonderful experience.

A 2018 report by the National Academies of Sciences, Engineering, and Medicine and the 2020 film *Picture a Scientist* illuminated the devastating impact of sexual harassment on the careers of women scientists. Is there anything that makes you feel hopeful that we can change the culture of STEM?

Absolutely. Let me start with what we have done within the NIH, led by the COSWD office. There was an [NIH-wide survey](#) of the climate to get a sense of what was happening, and it gave us valuable data about how frequently people were experiencing sexual harassment and bullying. This led to a campaign called "Harassment Doesn't Work Here." Looking outward, NIH now has a mechanism in place through which issues of harassment can be reported. This process has led to cessation of support for several scientists who had been well funded by the NIH following investigations and determinations by their institutions that there were issues of harassment. So people are taking this seriously.

Going forward, I think NIH initiatives that promote better environments—those that address and prevent both sexual harassment and racial inequity—are going to be really impactful. For instance, last December the NIH announced a funding opportunity called [FIRST](#) (Faculty Institutional Recruitment for Sustainable Transformation). FIRST's goal is to have academic and research institutions outside of the NIH bring in cohorts of scientists to enhance diversity at those institutions. These early-career faculty will have diverse perspectives, come from diverse backgrounds, become a self-reinforcing network,



We need to make sure that the pathway for future scientists is robust, that we have removed barriers and put in as many facilitators as possible.

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Dr. Marie Bernard, Chief Officer for Scientific Workforce Diversity (COSWD)
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get extra mentoring, and receive support in becoming successful scientists. The program will focus on the culture at those institutions, because it is their responsibility to provide warm and welcoming environments. The NIH UNITE Initiative is also going to be looking at other sorts of programs to help with institutional culture.

In addition, I'm very excited about the [prize competition](#) recently created by the NIH's Office of Research on Women's Health to encourage academic institutions to demonstrate their accomplishments in gender equity. The first set of awards was [recently announced](#). So, I think that these programs, the things that are happening in the overall culture, and the initiatives to incentivize organizations and institutions to do the right thing are all going to make for a much better environment for all.

The themes of this issue of *AWIS Magazine* are innovation and leadership. What is the most important leadership lesson you've learned that you would like to pass along to other women in STEM?

When I was at the start of my career, so-called "male" characteristics were put forward as reflective of good leadership; for example, being decisive or taking a "my way or the highway" approach. I'm very happy to have seen, reinforced repeatedly, that these characteristics do not actually define good leadership. In contrast, effective leadership calls for working in an open, supportive, and collaborative fashion. You need to be clear regarding your vision, and then you need to be able to listen. You need to engage and to activate people, and you also need to make sure that they have the resources they need to facilitate moving things forward. These leadership behaviors result in more highly performing organizations than those where one person at the top dictates things to everyone. Ultimately, facilitating full inclusion of diverse perspectives enhances creativity and innovation. That is what we are all about in science.

How can individuals in STEM contribute to the transformative institutional change that you're working toward?

I think that we all have a role. We need to recognize that we all have our biases about things—it's a means of survival. When we encounter something frequently enough, we categorize it so that we do not have to reevaluate it. This can lead to only seeing a certain type



"This is a unique time of openness and interest in diversity, equity, and inclusion."

of person fitting into a team, for instance. And that is something that we as individuals need to recognize. It does not mean we are bad—it's just the natural way our brains work. This is what is called implicit bias.

Recognizing that implicit bias exists is the first step. Then you can take steps to overcome it. Be very clear and explicit about the objective criteria needed in a collaborator whom you want to hire, and base your decisions on those objective criteria in a thoughtful and unhurried fashion, rather than making snap judgments. And when you see colleagues making their own snap judgments and exhibiting implicit bias, remind them of the steps they can take to overcome it.

I also think that there is an opportunity for all AWIS members to be aware of the initiatives coming forward from the NIH—like the UNITE Initiative—to help make this a more equitable environment.

Finally, this is a unique time of openness and interest in diversity, equity, and inclusion. I think that AWIS members should be cognizant of that and take advantage of it. Hopefully, this momentum will last for a long time. ✪

Jenna Jablonski is a marketing communications consultant and founder of [sisterstem.org](#), a website amplifying the voices of gender minorities in STEM.

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Susan R. Windham-Bannister, PhD
Chair
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Leadership Lessons from Women in Science

In this issue, we explore the importance of having women in leadership positions, advice on becoming a leader, how leaders can advance gender equity in STEM—and how women in STEM leadership roles crucially intersect with scientific innovation.

So what does it take to be a leader today? You'll find myriad answers in the following pages. Here are a few that resonated with me:

1) Leaders recognize inclusion and innovation as complementary pursuits. [Dr. Marie Bernard](#), who is featured on our cover, says "Ultimately, facilitating full inclusion of diverse perspectives requires coming up with good, creative, innovative approaches to things, and that's what we're all about in science."

2) Leaders embrace failure. According to AWIS member and higher ed research administrator [Nicole E. Quartiero](#), "Inevitably, researchers will make mistakes in their quest to move science forward, and lessons will be learned. All of these outcomes can be opportunities... and should not stifle future risk taking."

3) Leaders challenge the status quo. Leadership means "being bold and reaching out to experts who can offer a new perspective, even if it's outside your organization and challenges the norms that are established already in your

organization," says [Dr. Kathryn Starkey](#), Associate Dean of Adult Learning at Colorado State University Pueblo. She put this into practice by redesigning policies related to Title IX "rather than conducting business as it was done before."

We see women in STEM challenging norms throughout this issue: [women dominating in motor-sports](#), AWIS member [Rebecca Learned's](#) career in forensic science, and 2021 Kirsten R. Lorentzen award winner [Makyla Boyd](#) forging her own path in physics. We also see women scientists challenging norms through their advocacy work: [Syreeta Nolan](#) as a disability justice advocate, AWIS member [Elizabeth Trujillo](#) seeking to diversify STEM as a Latina scientist, and AWIS member [Dr. Mary Khetani and her colleagues](#) establishing an antiracist research lab network.

Whether you are in a leadership position or aspire to be, I hope these perspectives inspire you in your journey.

Yours in progress,

Susan R. Windham-Bannister, PhD
President, and Chair of the Board
Association for Women in Science

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The *AWIS Magazine* is a record of women's contributions to the STEM enterprise and their impact on society with story ideas that come from the real challenges our

members face every day in labs, classrooms, corporate boardrooms, and government offices around the country. *AWIS Magazine* contributors—who volunteer their time—mine their own experiences to create content ideas. As with all our publications, we look to our AWIS members across all disciplines and employment sectors to tell us where they need support in their work or in their lives and we offer them practical, everyday solutions that are impactful, smart, and inspiring.

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MAGAZINE LAYOUT
[Hung Nguyen](#),
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Reflections on AWIS leadership



Sandra W. Robert, CAE
Chief Executive Officer
AWIS

As AWIS celebrates 50 years of advocacy, I am proud of this amazing organization and everything we have accomplished. At the same time, it seems incredible that after half of a century of advocacy and impact, we are still battling bias and harassment in science and STEM fields.

AWIS is uniquely positioned to play a key leadership role in ensuring the access and equity for women in science careers. I know we are making a difference. When I speak with AWIS members, I hear stories of how the AWIS community has provided refuge, recognition, support, and opportunities.

This community relies on the AWIS Board of Directors to set the strategic direction and generously gift their time, experience, and connections to help AWIS succeed. I would like to take a moment to thank members of the AWIS board for their dedication and service, especially those who are completing their terms this year. If you, or someone you know, would like to serve on the board and help AWIS expand our impact, applications are due by midnight ET on October 27. The AWIS Nominating and Governance Committee will then prepare a slate for the membership to vote on later this year.

I would also like to recognize our extraordinary chapter leaders who build and mobilize the local boards. They volunteer countless hours, organize local advocacy and outreach, and provide the sense of community for which AWIS is known. Your leadership increases AWIS' wingspan and allows it to soar.

Last, AWIS benefits from mission-focused and passionate staff members who apply their energy and creativity to serve our members. Dolly Parton said, "If your actions create a legacy that inspires others to dream more, learn more, do more and become more, then, you are an excellent leader." By this definition, they are all leaders, and it's a privilege to work shoulder-to-shoulder with them, and as one of them.

Sincerely,

Sandra W. Robert, CAE
Chief Executive Officer
Association for Women in Science

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The Association for Women in Science is a non-profit, 501(c)(3) organization. AWIS champions the interests of women in science, and related STEM fields. Working for positive system transformation, AWIS strives to ensure that all women in these fields can achieve their full potential.

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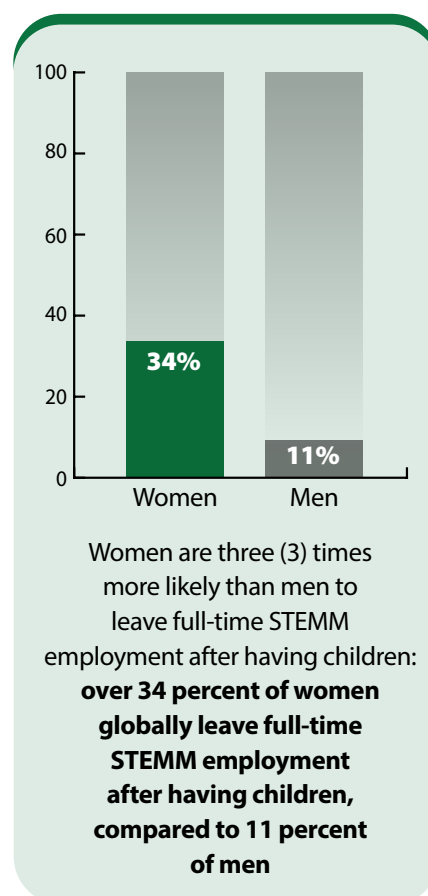
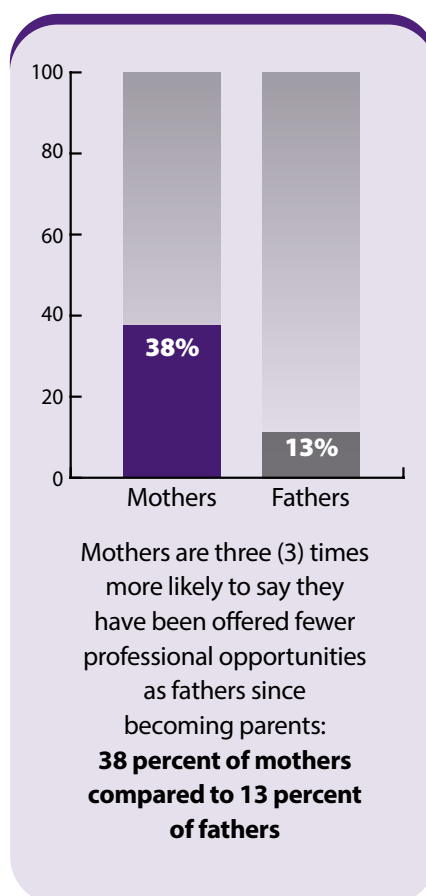
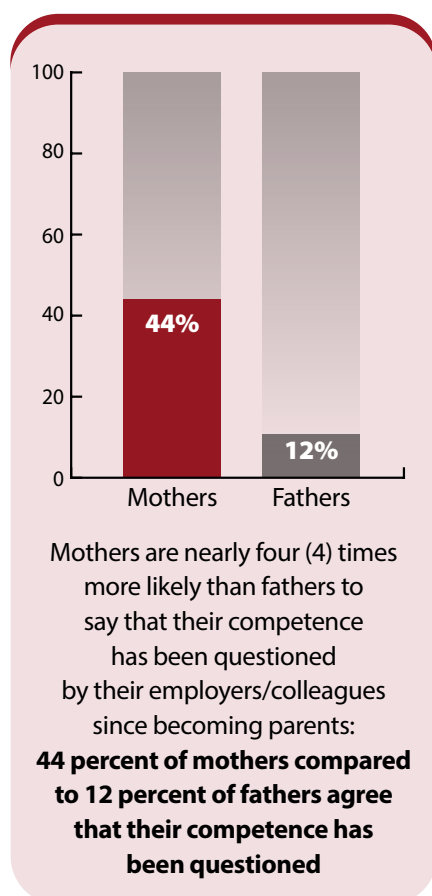
The Impacts of Parenthood Are Not Equal

By Shelley O'Brien, Chief Marketing Officer, AWIS

Research shows that women who become mothers are offered fewer opportunities and earn less over their careers. Men who become fathers do not experience these severe consequences. Consider these data points from the Mothers in Science's 2020 pre-COVID-19 global survey* "Impact of Parenthood on Career Progression in STEMM."



The Mothers in Science survey "Impact of parenthood on career progression in STEMM" was conducted between September 15th and December 31st, 2020. All responses correspond to the participants' situation **prior to COVID-19, and therefore, do not reflect the additional pressures brought on by the pandemic. The answers are based on self-report. A total of 8,930 participants, including mothers, fathers and non-parents, completed the survey. The study brings together survey participants from 128 countries, although the following countries are over-represented: the US, France, UK, Germany and Australia. As expected, women are also over-represented in the survey, which can be common in surveys related to women and caregiving issues. The survey was designed and led by Mothers in Science and conducted in partnership with INWES, Washington University St Louis, Parent in Science, Femmes & Sciences and 500 Women Scientists. Mothers in Science is analyzing the data in collaboration with a team of statisticians from the Universities of Grenoble, France and University of Toulouse, France.*



Mothers are perceived as less dedicated employees and less competent due to implicit bias and structural problems that have nothing to do with motherhood. For example, as the COVID-19 pandemic has demonstrated, women carry more of the burden for childcare and eldercare than men. Mothers require support from their partner at home, flexible workplace policies, and affordable and accessible childcare options. However, not everyone has access to these resources.

To be healthy and successful at work, women need to be able to 1) seek medical attention and informed advice and 2) to be able to make decisions about their reproductive health, including the choice about whether to have, and when to have, children. In science-oriented careers, particularly those in higher education where tenure may depend on stepped and timed advancement, the impact of an unplanned pregnancy can be especially significant.

Since men do not experience these challenges, any laws that interfere with women's reproductive health, including the timing of pregnancy, unfairly target women — especially

underprivileged women who may not have access to birth control, proper healthcare, transportation, and/or finances to obtain the care they need. To support women's careers, we need to support their right to choose. 🌟

Related Studies and Resources:

- [The unequal impact of parenthood in academia](#) (American Association for the Advancement of Science)
- [One factor explains much of the dearth of women in math-based fields](#) (American Scientist)
- [The changing career trajectories of new parents in STEM](#) (PNAS – Proceedings of the National Academy of Sciences of the United States of America)

With thanks to [Mothers in Science](#) for their permission to share data related to their 2020 survey, "Impact of Parenthood on Career Progression in STEMM"*



Leading Inclusively in the Science Academy

By Patricia Soochan

AWIS member since 2003

The concept of leadership is transforming dramatically: what was once a formal, hierarchical model based on patriarchy is emerging towards a model that relies more on social influence, which anyone with social capital can wield. According to entrepreneur Kevin Kruse, Founder and CEO of LEADx, leadership is, indeed, “a process of social influence, which maximizes the efforts of others, towards the achievement of a goal.”

At the same time that our broad understanding of leadership is shifting, so too is our belief that it be

exclusive. In fact, there is growing interest in the concept of “inclusive leadership.” Herb Thompson and Gina Matkin have taken a close look at this new lane of research. In their recent review article, [“The Evolution of Inclusive Leadership Studies: A Literature Review,”](#) they note that a search of the term *inclusive leadership* yielded an accelerated progression of articles, from just three pre-1990 to 421 between 2010 and 2019. They point out that this trend was concurrent with the progression in demographic diversity that has been occurring on college and university campuses.

In Theory

Another researcher, Dr. Noelle Witherspoon Arnold, describes the practice of inclusive leadership in the context of education as "advocating for and cultivating inclusive and culturally responsive practices and behaviors." She adds, in a post on [Higher Education Today](#), a blog by the American Council on Education, "Those who work in higher education must be trained to identify inequalities as they exist within institutions, to think beyond what exists to what could be, and to overcome inequalities as they transform organizations to be inclusive places." To this end, she has developed an emerging framework that focuses on place, preparation, and practice as overlapping domains for cultivating inclusive practices.

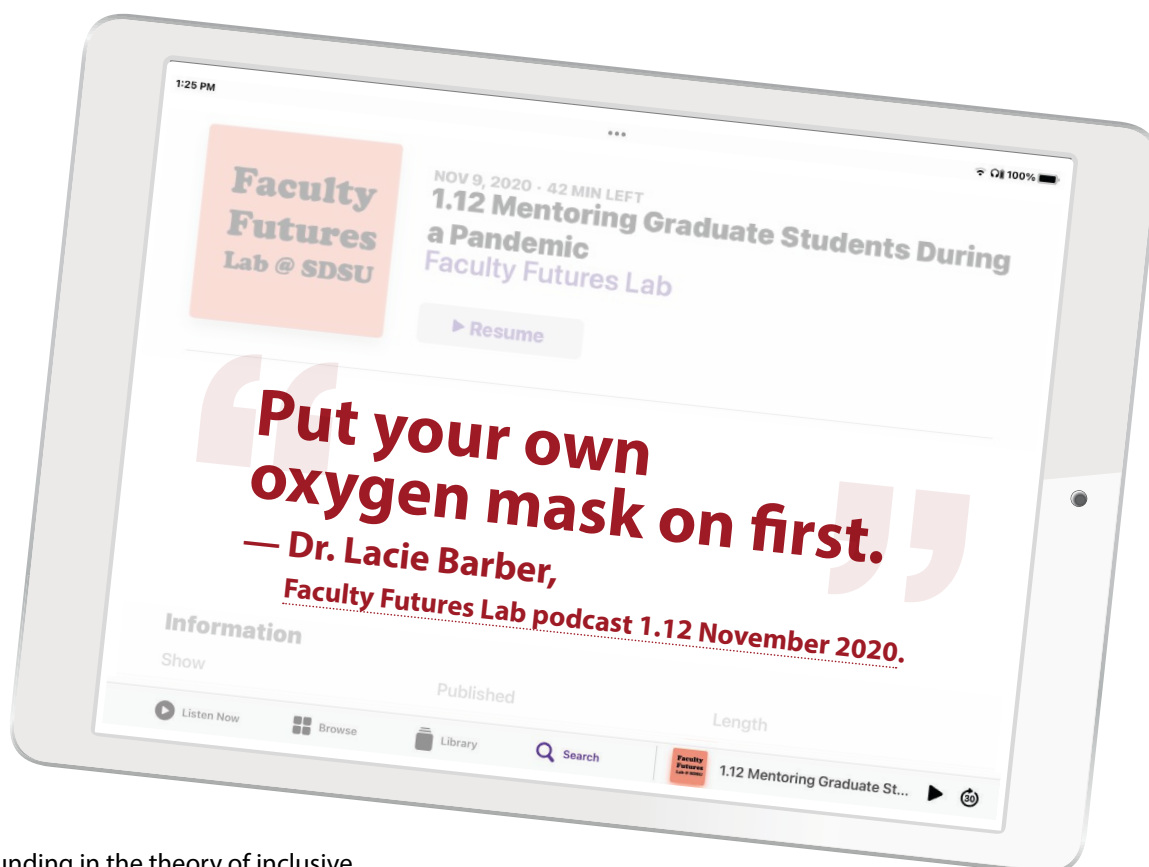
Figure 1 provides a model for a deeper dive into the characteristics of inclusive leadership. It is one among several frameworks that define the attributes and competencies of the individual inclusive leader.

Those who work in higher education must be trained to identify inequalities as they exist within institutions, to think beyond what exists to what could be, and to overcome inequalities as they transform organizations to be inclusive places.

— Dr. Noelle Witherspoon Arnold,
[Higher Education Today, May 2020.](#)

Figure 1. Traits and Competencies of the Inclusive Leader





In Practice

Even with a solid grounding in the theory of inclusive leadership, there often remains a gap in knowledge about how to translate theory into practice for faculty and other higher education leaders. For example, referring to Figure 1, the traits and competencies of inclusive leadership can seem daunting. Is it possible to find all traits and competencies in one leader? If not, how does a leader prioritize which attributes and skills she wants to acquire, and how does she cultivate them? And as with all self-improvement efforts, how does she ensure that the cultivation is ongoing?

Fortunately, there is a growing number of resources for faculty and others who want to embark on the path toward becoming inclusive leaders. One example is the [Initiative for Inclusive Leadership](#) developed by the Office of Faculty Advancement at San Diego State University

(SDSU). This program supports an annual leadership institute and other development opportunities for SDSU faculty. It also sponsors the [Faculty Futures Lab](#) podcast, with episodes such as “Labs during COVID,” hosted by engineering and chemistry faculty; and “Mentoring Graduate Students during a Pandemic,” hosted by psychology, chemistry, and math faculty. In the mentoring episode, Dr. Lacie Barber advises faculty to “put your own oxygen mask on first” and to advocate for recognition of the emotional/relational labor that is part of the socialization dynamic that disproportionately falls to women and faculty of color.

Practicing inclusive leadership is a commitment to one’s own growth and development.

— Dr. Brenda J. Allen, professor emerita,
University of Colorado Boulder



Having to navigate the unforeseen disasters and catastrophes of a pandemic tests leadership; but it can also help you expand your own comfort zone, and by extension, your ability to lead through crises.

— Dr. Wei Zheng in *Harvard Business Review*, October 2020.

Another resource for faculty who want to become inclusive leaders is a course created by the University of Colorado called [Inclusive Leadership: The Power of Workplace Diversity](#). This class is taught on Coursera by Dr. Brenda J. Allen, professor emerita, [author](#), and [YouTube](#) channel host. The course has already enrolled close to 44,000 participants globally, and its syllabus ranges from broad trends in the workplace to examining the conceptual elements that compose inclusion. It focuses on “[The Six Signature Traits on Inclusive Leadership](#)” of Bernadette Dillon and Juliet Bourke, experts in human capital at Deloitte. The traits are commitment, courage, cognizance (of bias), curiosity, cultural intelligence, and collaboration.

I asked Dr. Allen about the most important messages she tries to convey during her instruction. To start with, Dr. Allen says it is important for everyone to recognize their own agency to engage in inclusive leadership, whether they are in a formal leadership role or not. She notes that a critical building block toward inclusive leadership is self-awareness that is aimed at learning to value and respect oneself, a crucial step toward learning to value and respect others. By modeling self-awareness practices, she adds, one invites others to be honest, open, and vulnerable, or, in other words, authentic.

Dr. Allen also advises that it is helpful not to engage in “either/or” thinking or absolutism, but instead to think of positive traits along an aspirational spectrum, to celebrate one’s accomplishments, and to embrace being a lifelong learner. She adds that by practicing self-awareness, leaders may recognize the traits that already lie within them, as well as those that need more time and attention to develop and that “practicing inclusive leadership is a commitment to one’s own growth and development.”



As a starting point, Dr. Allen recommends focusing on deeply examining one’s personal values and understanding of the scholarship of diversity, equity, and inclusion to inform one’s commitment to inclusive leadership. Along the journey, a good mechanism for assessment is deliberately and informally seeking feedback from others. To mitigate the negative effects of interpersonal power dynamics, when attempting to obtain frank feedback, a leader should strive to cultivate a team culture of nonpunitive, open dialogue.

Asked about what features of academic science are amenable to or challenging for the practice of inclusive leadership, Dr. Allen mentions the ethos of curiosity, discovery, and innovation in science as favorable for developing inclusive leadership. On the other hand,

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the sense of superiority sometimes implicit in scientific epistemology and specialized knowledge can impede creating an inclusive environment.

Dr. Allen stresses that since women tend to be socialized to be inclusive, it is important for them to be particularly intentional about their practice, including recognizing the importance of [intersectionality](#) in identities. Specifically, women with dominant identities must recognize that although they may empathize with people of nondominant identities, they will never fully understand what it is like to experience life as their peers with nondominant identities do.

In the Zeitgeist

The exigency to create inclusive cultures to counteract the systemic social injustices brought into relief by the 2020–2021 pandemic and by incidents of racial injustice, along with the recognition of systemic barriers within science education, such as gatekeeping in introductory courses, are driving the demand for inclusive leadership in postsecondary science education. Indeed, some argue that colleges and universities are the ideal settings for inclusion research and practice, as these institutions are supposed to be models of deliberative democracy reflected in civil discourse. It is also during times of crisis, when staff morale can be particularly stressed, that the need for inclusive leadership becomes most acute.

Another leader in this field, Dr. Wei Zheng, associate professor and Roscitt Chair in the School of Business at Stevens Institute of Technology, has written about strategies that leaders used to guide their staff through the 2020 pandemic. In her survey of various industries, employees reported feeling most reassured by leaders' small affirmations, provision of individualized support, shared decision making and job functions, and the designation of time and space for team bonding. In her *2020 Harvard Business Review* [article](#) she advises, "Having to navigate the unforeseen disasters and catastrophes of a pandemic tests leadership; but it can also help you expand your own comfort zone, and by extension, your ability to lead through crises."

Dr. Allen similarly emphasizes that the 2020–2021 crises have given inclusive leadership practitioners the

opportunity to seize the moment to strive to support each other, increase their commitment, and strategize systemic ways to sustain this movement's momentum. ✪



Patricia Soochan is a Program Officer and member of the multidisciplinary team at Howard Hughes Medical Institute (HHMI), with primary responsibility for the development and execution of the Inclusive Excellence (IE1&2) initiative. Previously she had lead responsibility for science

education grants to primarily undergraduate institutions, a precursor of IE. She has served as a councilor for the Council on Undergraduate Research and is a contributing writer for *AWIS Magazine* and *Fireside Friday*. Prior to joining HHMI, she was a science assistant at the National Science Foundation, a science writer for a consultant to the National Cancer Institute, and a research and development scientist at Life Technologies. She received her BS and MS degrees in biology from George Washington University.

Editor's Note: The contents of this article are not affiliated with HHMI.



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Our goal is also to retain our diverse workforce, through mentorship and sponsorship opportunities and through AstraZeneca’s thirteen ERGs. Our ERGs specifically align with business priorities and are supported with funding and leadership structure. They concentrate on sustainability and business connectivity, and they have a people focus. This allows for ERG autonomy, fosters leadership engagement, and provides true resources to the business. We hope that through the ERGs, our employees feel free to speak their mind and to help us create a more inclusive culture.

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Four Essential Leadership Skills for Scientists

By Juliet Hart, Leadership Development Consultant at Hart & Chin Associates, LLC
AWIS member since 2017

“What do I need to do to get to the next level in my organization?”

“How can I effectively transition in my scientific career?”

“How do I gain support for my innovative ideas?”

These are the types of questions scientists regularly ask me. To answer them, I draw from my own experience, as well as that of others working with scientists, and the conclusions are surprisingly similar. In addition to the time and background required of a STEM professional, there are four essential skills senior leaders, hiring managers, and even investors consistently look for in a strong leader: collaboration, adaptability, communication, and the ability to create a shared vision.

These skills focus on the ability to work with others and effectively lead a team. Through experience, training, and coaching—with continuous feedback and practice—you can further develop these essential abilities to become a successful leader in science.

Collaboration

Scientists who are early in their careers are expected, independently, to develop ideas for their research projects, execute their experiments, and write their thesis or dissertation. This rigorous development of analytical and independent critical thinking is

deemed crucial to the scientific endeavor. But once you step outside of the role of student, the expectations change. You quickly find that the need to collaborate, partner, and work with others is increasingly important in expanding your resources and capabilities, and advancing your work.

There are many ways in which you can become a good collaborator. Examples include effectively listening to others, fostering a supportive environment, and owning your agreed upon responsibilities. But one misconception that can get you into trouble is that good collaborators must always give in to others. Actually, learning how to productively and respectfully disagree is more important and impactful to a team's ultimate success. Knowing how to disagree constructively is also the first crucial step in driving innovation.



Adaptability

Far too often, I have heard non-scientist managers or colleagues express their wish that their scientist report or co-worker be “coachable,” meaning that the scientist should be open to feedback and to trying different approaches. This desire usually comes from a collaborator wishing that the scientist could see the situation from another perspective or could better understand the needs of others. In my experience coaching scientists, I have found that they are absolutely “coachable.” The coaching outcome is best, however, when a very logical approach is taken to address their

needs and the needs of others on their team. In other words, just appealing to emotions or intuition alone, or creating a sense of urgency, is often not enough to compel a scientist to take action. Having reasoned arguments with supporting evidence helps to drive action.

Yet, there definitely is a great urgency for scientists to enhance their adaptability. Learning to flex during ambiguity and address the needs of the people around you is an important skill for achieving your team's goals and for finding success in the workplace. Being adaptable means that you can continually find ways to learn from challenges, learn not to repeat past mistakes, gain broader perspectives, and increase your capability to manage future needs.

Communication

The ability of scientists to communicate the value of their work is a skill particularly challenging for experts in some specialized fields. To explain the complexities of your work in a way that is clear enough for the layperson to understand requires a considerable amount of empathy for your listener, and quite often a shift in mindset. When scientists speak to fellow scientists and share data, they expect the other scientists to think critically about the information and its limitations. Through their conversations, they continually challenge the science and push it forward. But when nonscientists listen to a scientist, they are trying to comprehend the information and figure out how it applies to them and their situation.

Scientists who cannot describe their research in a meaningful context for their listeners face true limitations: how will they explain its significance and how does it translate into value in the workplace? It can take a fair amount of effort for scientists to "switch gears" and think about the perspectives

One misconception that can get you into trouble is that good collaborators must always give in to others. Actually, learning how to productively and respectfully disagree is more important and impactful to a team's ultimate success.

of non-scientists, think about how much the public comprehends, adapt their explanations, and ultimately begin communicating in terms that resonate for laypeople. Learning how to communicate with the broader public is an active skill that I work on with many clients, helping them learn how to distill complex ideas into what is most important for their audience, while not oversimplifying or coming across as too negative and unwilling to engage.

Creating a Shared Vision

Creating and communicating a vision may feel like an uncertain and ambiguous task to many scientists, but having this shared vision is foundational to effective leadership and a successful outcome. It is important to understand real challenges you are faced with, the

changes you want to see, and then articulate this understanding and your needs. Without this clarity, it is hard to sustain your team's motivation to achieve its research goals. Also, it is easy to get wrapped up in just making minor contributions to the bigger research picture without ever owning it. You must own your vision, commit to it, be responsible for it, and believe that it is achievable. By creating this vision and clearly expressing it, you make it possible for others to share it, align with its goals, and commit to achieving the vision with you.

Achieving Success

Enhancing these four essential skills is critical for your success as a scientist and for the success of your team. Further developing these skills can open you up to opportunities that were not accessible before and will support your journey as a leader. For me, personally, I envision a future with more influential STEM leaders. Toward that end, I will continue to create resources to support and empower scientists on their leadership journeys to create a better world and I ask you to join me. 🌱



*The principal and founder of Hart & Chin Associates, LLC, **Juliet Hart**, is uniquely focused on providing professional*

development for scientists. Using the combination of her experiences in scientific research and learning and development, she delivers innovative tools and strategic solutions that address the multitude of challenges that exist for professional scientists and their organizations.

Closing the Gender Gap at Genentech: One Company's Science-Based Approach to Driving Gender Parity

In 2007 Genentech's then-CEO, Art Levinson, shared a revealing chart of the gender breakdown within the company's leadership ranks. While among all employees, the proportions of men and women were nearly the same, women accounted for 44% of managers/supervisors, 41% of directors, and a mere 16% of officers (the vice president level) and above. "Do you see how wrong this is?" Levinson asked. It wasn't just wrong in terms of fairness and ethics, he made clear, but wrong because a diversity of experiences and perspectives is critical to driving innovation and, ultimately, to achieving better outcomes for patients.

Since that 2007 meeting—and as a result of more than a decade of determination—Genentech has more than doubled the percentage of female officers at the company. Today 54% of Genentech's workforce, 53% of directors, and 43% of officers are women. The company's equitable pay practices have also resulted in there being no effective pay differences between women and men, or between people of color and white employees. But this progress has not come easily. It has required a commitment to gender parity across all levels of the company and a multipronged effort to address barriers to the advancement of women to senior leadership roles.

"That moment in 2007 caught everyone's attention," says Denise Smith-Hams, Genentech's former head of HR. As they dug deeper, they uncovered numbers that told a disconcerting story: not only were there five times as many men as women in officers' roles at Genentech, but female directors (the level preceding officers) were leaving at twice the rate of their male counterparts. "The data indicated that 45% of our directors were female, which meant we should have had a good-sized candidate pool of women moving into the officer level," says Smith-Hams. "And so we started getting very curious about why that wasn't happening."

Sara Kenkare-Mitra, senior vice president of Development Sciences, recalls those days—and those barriers. "Twenty years ago, there were only a couple of women on the executive team, plenty of women like myself who were scientists, but a wide gap in between, with a very skimpy population of women in the higher ranks," she says. At the time, she adds, people at Genentech wanted diversity at the table, were supportive of women, and were open to dialogue and solutions, "But they didn't know how to bring about change."





Inspired by Levinson's challenge, the company set out to close the gender gap in its leadership ranks.

A Data-Driven Process

Genentech started by applying the rigor and analysis of scientific research to the problem of gender equity, first conducting research to pinpoint the obstacles blocking women's paths to success.

The company collected subjective data (through surveys and focus groups) and objective employee data (by looking at factors such as the difference between the number of women who applied and were invited to interview for open roles and the number of those women who received and accepted offers). They discovered that women felt they had fewer opportunities than men to take on visible and challenging assignments and were less likely to receive meaningful performance feedback and fair assessments. They also learned that women believed their ideas were less apt to be heard and acknowledged and that they had fewer opportunities to participate in the informal networks that are often key sources of information about what's happening within an organization.

Genentech also leveraged information from the nonprofit Healthcare Businesswomen's Association (HBA), whose landmark E.D.G.E. in Leadership Study outlined best practices for recruiting, advancing, and retaining women at pharmaceutical and biotechnology companies.

Commitment and Accountability

In 2010 Genentech's Executive Committee set a corporate commitment for the organization: identify and remove barriers to the advancement of women to senior leadership positions and increase the pool of women qualified for such positions by 50%.

They knew that visible senior leadership commitment and active support would be critical to moving the needle on gender parity. Former CEO Art Levinson had initially raised the issue, but the commitment to diversity and inclusion has since been championed by numerous senior leaders across the organization.

As they took on this mission from the top down, Genentech made everyone accountable for their commitment to gender parity. The company expected their leaders to create succession plans for top-performing team members. And, if there were no women on a leader's list, the leader was expected to explain why—to managers, HR business partners, executive coaches, and the organizational development team. These kinds of conversations, which had never taken place before, proved instrumental in raising awareness of the issue and in helping close the gender gap on teams. At no point on the journey did Genentech compromise the company's high standards to close those gaps, but they instead challenged biases and changed behaviors to positively disrupt the status quo.

In launching their gender-diversity initiative, the company established a baseline against which they could measure progress year after year. Genentech originally only provided an annual progress update to the board of directors, but they began sharing the data with employees in 2019. And in 2021 the company published its inaugural [Diversity & Inclusion Report and 2025 Commitments](#), so employees, peer companies, and candidates could also hold Genentech's leaders accountable.

Recognizing and Growing Existing Talent

One of the key initiatives that the company implemented was an effort to raise the visibility of women who were primed to move to the next level in their careers. Managers advocated for them in talent-review discussions, through which a broader team of senior leaders could have insight into their potential. The resulting opportunities—

to participate in rotational assignments, lead special projects, and cover for more senior colleagues on leave—enabled the company to build more thoughtful development and succession plans.

In addition Genentech began fostering vibrant internal networks and communities, including the Genentech Women Professionals employee resource group, which hosts career-development events and informal networking activities; and also launched a sponsorship program composed of senior leaders, who act as sounding boards and advocates for the women partnered with them. The Genentech Women in Science and Engineering (gWISE) group was also established to address the unique needs of women in science and engineering roles, for whom closing the gender gap has remained particularly challenging. gWISE offers speaker series, leadership and career development workshops, facilitated small-group discussions, and roundtable and networking events—all aimed toward developing leadership skills for women; nurturing an inclusive and diverse culture; improving Genentech's ability to attract, mentor, and connect diverse women at all levels; and celebrating the career contributions of women in science and engineering.

Improving the Talent Pipeline

Beyond nurturing the talent that already existed within the company, Genentech recognized that establishing a robust pipeline of candidates would be equally important. They developed targeted marketing strategies, sponsored and attended conferences geared toward women in science, and joined professional women's associations similar to HBA.

They also redesigned their interview process. The talent acquisition team assembled a key roster of women, who volunteered to join interview panels for roles outside their functions. This group of women, who provided candidates with diverse perspectives on the Genentech employee experience, also helped ensure that the company assessed these candidates as much on their alignment with Genentech's values, core competencies, and leadership commitments as on the skills and technical expertise that they could bring to their roles. These and other changes helped reduce biases in hiring decisions by encouraging and enabling the company to evaluate candidates based on their abilities, rather than on the titles on their resumé or on the interviewers' assumptions and preferences.

Additionally, Genentech was conscious of the need to think longer term and to invest even earlier in the careers of future STEM professionals, so the company began committing time, expertise, and resources to science education initiatives. For example, Genentech's \$32.5M



At no point on the journey
did Genentech compromise
the company's high
standards to close those
gaps, but they instead
**challenged biases and
changed behaviors
to positively disrupt the
status quo.**

Futurelab program is dedicated to helping 9,000 diverse K-12 students in South San Francisco reach their potential as the next generation of innovators, by engaging them in a lifelong exploration of science.

Celebrating Success and Making New Commitments

Data from the past decade, which show a doubling in the percentage of female officers at the company, offer a valid cause for celebration. However, in looking at the progress to date, Genentech remains acutely aware of the hard work that still remains.

"We've made significant progress since Genentech initiated a dedicated focus on accelerating the advancement of women, but the work is far from over," says Heleen Scheerens, vice president of OMNI-Biomarker Development and former chair of gWISE.

The company is now closely evaluating and continually exploring opportunities to advance gender representation in STEM roles, and this is a key component of Genentech's newly launched [2025 Diversity and Inclusion Commitments](#).

One significant hurdle is the overall underrepresentation of women in STEM across academia and industry. “The pool of female applicants for scientist positions is smaller,” says Margaret Porter Scott, vice president of Cellular Pharmacology and current chair of gWISE. “That is where the lack of gender parity starts, and it creates a challenge for us in hiring equally.”

Yet PhDs in these areas are actually nearly equal these days, says Porter Scott, with some variation across disciplines. “We have a hypothesis that some women may be opting out of the scientist track for perceived work/life balance issues,” she notes. She believes Genentech’s reputation as a place that supports female scientists in their careers and in their work/life balance will help. “gWISE is focused on helping Genentech become the number one company for the recruitment and development of female scientists,” Porter Scott adds.

Genentech is also applying the lessons learned in advancing gender equity to other historically underrepresented groups. More than 52% of the overall Genentech employee population identifies as Asian, Black/African American, Hispanic/Latinx, Multiracial, Native American/Alaska Native or Native Hawaiian/Pacific

Islander. However, the gap widens in leadership roles. “We’ve broadened our diversity and inclusion efforts to help ensure that our workforce reflects the increasingly diverse world around us,” says Cynthia Burks, Chief People & Culture Officer.

To that end, Genentech—under the leadership of its Chief Diversity Officer, Quita Highsmith—has this year announced new commitments that include the expansion and acceleration of efforts to increase the numbers of currently underrepresented people of color in leadership positions. Specifically the company aims to double the representation of Black/African American and Hispanic/Latinx directors and officers and increase the representation of Asian directors and officers so it reflects the proportion of Asian individual contributors and managers/supervisors.

“Our mission is to deliver scientific innovations that drive better outcomes for our people, patients, business, and communities,” says Highsmith. “We can only achieve this by advancing and boldly championing diversity, equity, and inclusion within and beyond our walls. Our commitments serve as a transparent way to drive us forward.” 🌱



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feature

diversity in professional racing

women

*Maureen McVail, Founder and
Chief Innovation Officer of MORacing, in her
Porsche—and her safety helmet—ready to race.*

in the Driver's Seat

By Kimberly Scata, PhD
AWIS member since 2001

Throughout history, discontented and determined women have not just sat by, idling. They have protested and banded together, time and again. For example, as a result of their tireless efforts, women activists succeeded in getting the Nineteenth Amendment ratified in 1920, which granted them the right to vote. More quietly but significantly, in 1971 thirty-five women scientists gathered together to create the Association for Women in Science (AWIS), with the mission of advocating on behalf of women in STEM, and they have worked to do so ever since.

Similarly, in the world of racing today, women are celebrating, supporting, and promoting each other's successes and show no signs of braking their progress. What follows is a sampling of stories about these high-octane women.

Making History

In the history of the Indianapolis 500, only nine women have qualified for and competed in the prestigious race. In

2021, Paretta Autosport was the first ever majority-woman team to qualify for the Indianapolis 500, earning their spot for this year's race in May. Team principal and CEO Beth Paretta put together the team of drivers, spotters, engineers and mechanics — 70% of whom are women — and trained them in roughly four months.

Lead driver Simone DeSilvestro of Paretta Autosport, making her sixth start at the Indy 500, had to withdraw after finishing 170 of the race's 200 laps when her car experienced brake problems. Despite this disappointment, CEO Paretta remains committed to increasing diversity in professional racing, and she hopes that the visibility of her accomplished team will inspire women to pursue careers in auto racing.

Pursuing a Passion

Maureen McVail, who is Founder and Chief Innovation Officer of MORacing, also avidly promotes the empowerment of women through motorsport



McVail, passionate in her love of cars, relishes in sharing her knowledge and enthusiasm with other women.



McVail—in a sentiment shared by many of the women in the article—enjoys the camaraderie shared while spending time with other car lovers. In October 2020, Maureen organized the SHE Leads Road Rally. Women in race cars travelled from Philadelphia, PA to Seneca Falls, NY. Their goal was to drive change in celebration of the 100th anniversary of women's suffrage.

feature

diversity in professional racing



McVail, shown with one of the eight race cars she has owned, is eager for more women to experience the thrill of racing whether in the driver's seat or as a knowledgeable spectator.

opportunities. Her enthusiasm is boundless as she encourages women's participation in all auto racing roles: as drivers, crew members, and spectators.

McVail's interest in cars began when she was eleven, after her parents bought an old Mercedes. In 1999 she purchased her first Porsche. She says, she "took it to the racetrack, where it belonged." She became hooked on "driving on tracks where racers drive."

Her biggest challenge has been to persuade men to view her as a peer and to take her interests seriously. In 2000 she finally met some men who recognized and supported her

McVail's biggest challenge has been to persuade men to view her as a peer and to take her interests seriously. In 2000 she finally met some men who recognized and supported her eagerness to learn about cars.

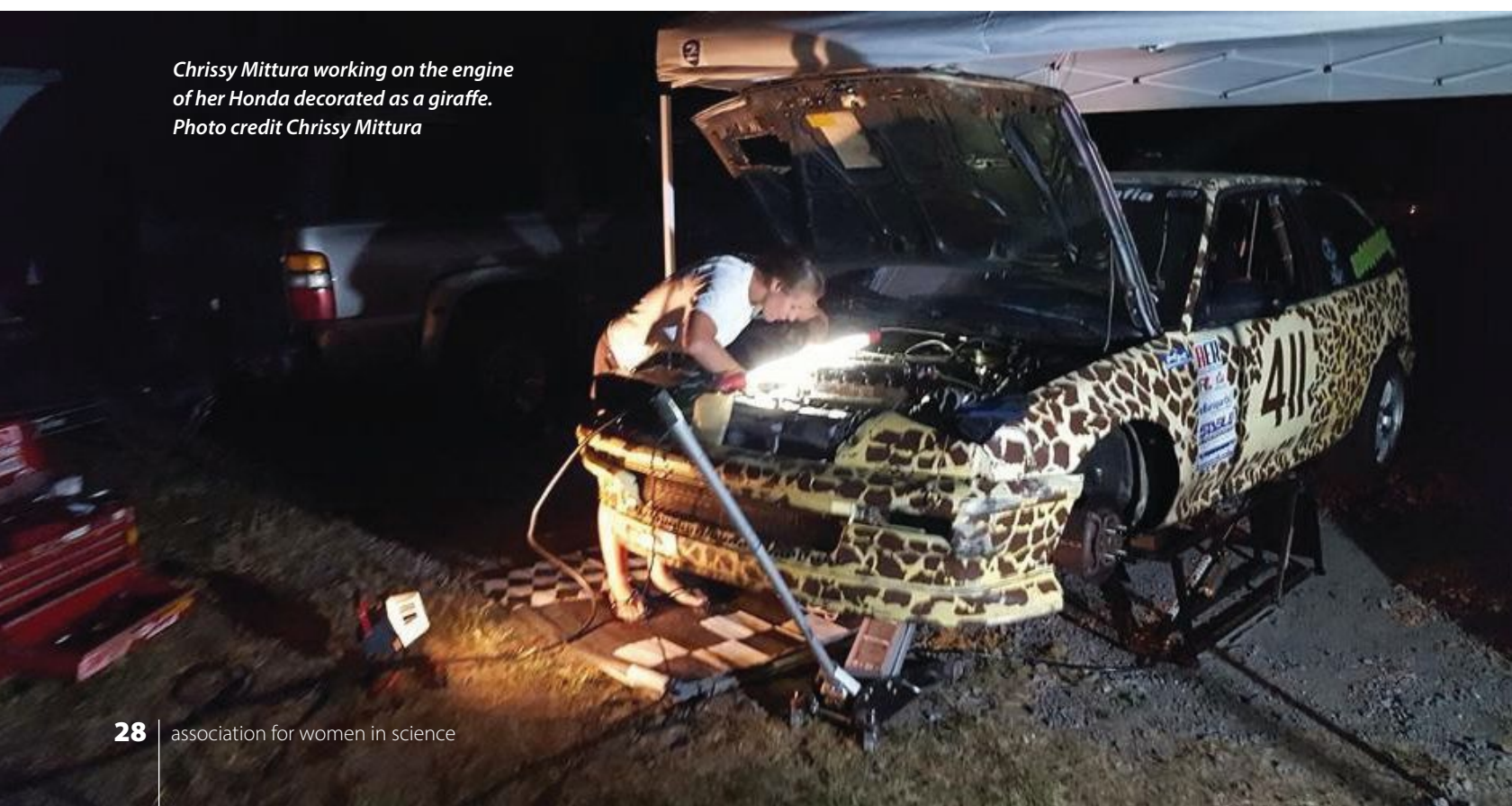
eagerness to learn about cars. She now frequently spends Tuesday nights working on cars with them.

In 2019 she left her job at Drexel's Institute for Women's Health to become a mechanic's apprentice. McVail encourages other women who might be interested in acquiring these skills to go for it: "If a middle-aged woman can do it, so can you!"

Competing Confidently

Sabr  Cook, whose competitive spark ignited when she started racing go-karts as a child, has found motorsports to be incredibly expensive. She asserts that

*Chrissy Mittura working on the engine of her Honda decorated as a giraffe.
Photo credit Chrissy Mittura*





Decorating the cars is part of the fun of the 24 Hours of LeMons races. Photo credit Chrissy Mittura

getting sponsorships is difficult, even for men. Despite this challenge, she likes breaking barriers and proving people wrong.

In 2019 she was chosen for the prestigious W-Series, an all-female, single-seater racing championship. The W-Series, by mandating that cars be mechanically identical, focuses on the talent of the driver and serves as a mentoring organization that aims to lure more top-notch women into competitive racing.

Because she is competitive by nature, Cook wants to be judged for her driving skills, not for her gender. That being said, she does believe that women bring some unique skills to racing. For example, she notes that women approach decision-making differently from men. In addition, she asserts that women tend to be more patient, make smarter choices, are more physically resistant to vertical and lateral G forces, and are better at dissipating heat. These characteristics are advantageous for endurance racing.

After receiving her bachelor's degree in mechanical engineering from the Colorado School of Mines, Cook was named the 2018 U.S. winner of a prestigious training program with Infiniti Engineering Academy, which is co-run by Infiniti and Renault F1. Her long-term goals are to drive and to work as an engineer with Indy Cars.



Maureen inspires a future race car driver.

feature

diversity in professional racing

Controlling Costs

While the expense of Indy and Formula 1 cars is a barrier for many people, there are alternative racing options. For example, Chrissy Mittura races “cheap cars” in “24 Hours of LeMons” endurance races, which focus on fun and safety. The term cheap, however, is definitely relative. The LeMons races use old street cars valued at roughly \$500. For example, Mittura converted her 2007 Mazda 3 hatchback into a racing car. The cost to adapt these cars to meet safety standards at high speeds, however, can be quite expensive.

As a Safety Compliance and Training Supervisor for AmeriGas by day, Mittura takes safety very seriously. Mittura, her husband, and two friends spend time fixing the car and ensuring that it measures up to safety standards. She reminds the team to comply with safety measures as they work on the car. She acknowledges that she prefers racing to the repair work, but she and her team do this work themselves to keep costs in check.

Traveling to the races is also costly since these weekend competitions are held in far-flung locations. However, she enjoys catching up with racing friends at these events, sharing meals and stories with them.

Mittura wants to be taken seriously as a driver and has worked hard to gain the respect of other participants. She sees herself as an ambassador to the sport and serves as a friendly, helpful, inviting, and knowledgeable presence at these endurance races.

Navigating Rough Terrain

Shannon Fleming Czarnota’s interest in motosports started as a child when she attended her dad’s motocross competitions and was further fueled when she began riding dirt bikes herself. Motocross involves riding a



Lori Johnson supervises as a member of AWIS-PHL removes the lug nuts from the tire. Credit Maureen McVail

specialized motorcycle on a course of open and rough terrain, which makes racing especially challenging, both mentally and physically.

With her dad as her coach and mechanic, she began competing in motocross with increased dedication when she was 13. Czarnota placed in the top ten for each of the five years she competed at Loretta Lynn’s Amateur National Motocross Championship (her best finish was fourth overall).

Unfortunately, women’s motocross eliminated their pro circuit in 2019, due to a lack of qualified riders. Without

To Learn More:

Paretta Autosport: <https://www.parettaautosport.com/team>

MORacing: <https://www.moracing.net/>

Sabré Cook racing: <http://www.sabreckookracing.com/>

W-Series women’s racing: <https://wseries.com/about-w-series/>

Endurance racing in cheap cars: <https://24hoursoflemons.com/>

Beginner’s guide to motocross: <https://americanmotorcyclist.com/beginners-guide-to-motocross/>

Porsche Club HPDE: <https://www.pca.org/drivers-education>

Ladies, Start Your Engines: <https://www.ladiesstartyourengines.com/>

Girl Gang Garage: <https://girlganggarage.com/all-female-builds/>

a professional option in motocross, Czarnota ended her racing career. Still, she says that motocross taught her discipline and determination, skills that will serve her throughout her life.

Finding Alternate Pathways

There are many opportunities for women who don't want to race, but who do want to be in the driver's seat. Varsovia Hernandez enjoys driving fast, but she decided a while back that racing isn't for her. Seven weekends per year, she attends the Porsche Club's high performance driver's education (HPDE) classes, which "are designed so that participants can improve their driving abilities and acquire a better understanding of vehicle dynamics and driving safety." HPDE programs consist of classroom instruction and driving time that teaches students how to get the best performance out of their car. Driving is done on a closed course, which allows participants to operate their vehicles at high speeds safely. Other organizations, such as the BMW Car Club of America and the National Autosport Association, also offer HPDE programs.

Hernandez emphasizes that HPDE is for anyone who would like to improve their skills. Participants learn about tires, brakes, the physics of driving, forces pulling the car, and safety—all lessons applicable to everyday driving.

She observes that women are more analytical and careful during the classes: "Men put the seat belt on and start driving. Women are interested in understanding why and how the car behaves, and they are more precise in their driving."

Welcoming Other Women

Instructor Lori Johnson focuses on women's curiosity and desire to understand how a car works, in her class, Ladies, Start Your Engines. She believes in empowering women to perform their own light car maintenance.

In Autumn 2019 the Philadelphia AWIS chapter participated in one of Johnson's hands-on presentations. The class was entertaining and informative, as Johnson is both a skilled teacher and a highly knowledgeable mechanic. She ably demonstrated how women can benefit from engaging in an analytical approach to problem-solving. By way of example, she discussed the notoriously difficult challenge of removing lug nuts when you change a tire. She explained that if you approach the problem by standing on the lug wrench and using your body weight to loosen and later tighten the lug nuts, it becomes much easier. She also talked about giving women the language they need

to communicate and understand technical jargon, thereby making a trip to an auto repair shop less intimidating.

Johnson, who received a degree in women's studies from Temple University before training as a mechanic, outlined some of the issues women face in nontraditional roles in the automotive world. For example, some male customers refuse to have a woman work on their car. Women are often relegated to simple tasks, rather than given more challenging and rewarding repair work. And, not surprisingly, women often earn less than their male counterparts. The result of such discrimination is the same type of "leaky pipeline," or attrition, encountered by women in STEM fields.

In addition to classes like "Ladies, Start Your Engines," Johnson shared other opportunities to learn about cars in female-friendly environments. The Girl Gang Garage, located in Phoenix, Arizona, sponsors all-women builds, which they have perfected to offer "a premier training and educational opportunity for women of all ages and experience levels." The hands-on experience allows women of all ages to learn or to improve their automotive skills while building a car.

Women interested in auto mechanics and motorsports have an increasing number of welcoming outlets for learning about and participating in the world of cars. Johnson offers inspiring words that seem relevant to the women of AWIS: "Women have a lot of power; we should use it correctly to make change." It's exciting to see the shifts occurring in the racing world and related industries. I hope these stories about women who are automotive leaders encourage more women to make their own inroads. ★

Author's note: The author would like to thank the women interviewed for this article.

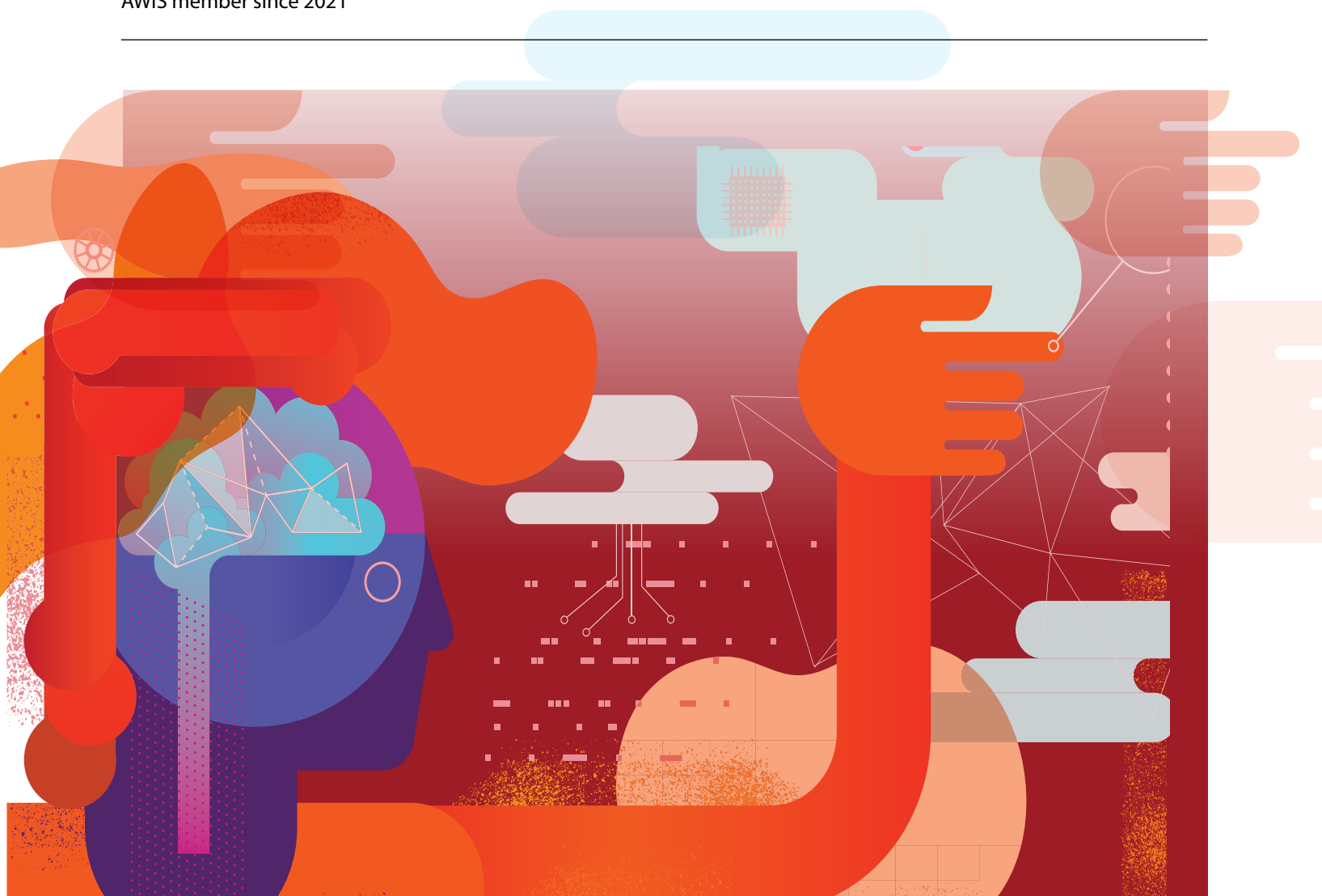


Kimberly Scata received a B.S. in biology from the College of William and Mary and a PhD in molecular biology and genetics from the University of Pennsylvania. Scata served as the President of the Philadelphia Chapter of AWIS in 2019–2020, and she is currently a member of the AWIS Chapter

Advisory Committee. She is a great believer in the power of STEM programs to harness the innate curiosity of young children, and she is always eager to help promote women in the sciences.

At the Intersection of Innovation and Leadership: Critical Skills in Research Administration

By **Nicole E. Quartiero, MS, CRA**, Higher Ed Research Administrator
AWIS member since 2021



Research administration is not for the faint of heart. To be successful in this field requires in-depth knowledge of various federal regulations, coupled with skills in managing a whole host of other business functions (e.g., compliance, finance, HR, etc.). Science and the national landscape that governs research are ever-changing, and as a result, we, as research administrators, must constantly adapt to new challenges. We must

develop and deploy state-of-the-art processes and practices to effectively manage these shifting challenges and our complex work.

I spend my days as a research administrator engaging in wide-ranging conversations about innovative projects developed by faculty leaders in various disciplines. Back in my graduate school training, I had to take several courses

focusing on innovation and leadership, so I became familiar with these concepts and their importance. More recently, as a reasonably new manager, I have been exposed to many real-life examples of true innovation and effective leadership. But despite this exposure and my training, I am just now learning the specifics of how to create a culture supportive of innovation and of how to provide the coaching necessary to build this culture.

As I contemplated how to share my thoughts about these tasks with you, I found myself in a rabbit hole, trying to accurately describe just what leadership and innovation are. Since these concepts can be elusive to define, I consulted with my most trusted adviser—my nine-year-old daughter. When I asked her what the definitions of innovation and leadership are, she promptly responded as follows (and with the “Duh, Mom,” look on her face): “Innovation is experimenting with different things until you find something that works, or works better than what you already have. And leadership is being a good example for the people around you and volunteering for things, like student council, to make things better and to represent your class.” Both are very accurate definitions, in my opinion. With my daughter’s definitions in mind, it is easy to see how these concepts are so closely related and interconnected, and how they are very representative of what research is: experimenting with innovative treatments, applications, and concepts, while being a thought leader in your respective discipline. And if innovation and leadership are so fundamental to research, it makes sense that research administration would also benefit from creative, inventive practices.

In order to effectively promote innovation, leaders in research administration should consider the following:

- **Leadership is the foundation of innovation.** People cannot be creative without the support and backing of good leaders. Leaders can create a culture of innovation by including it as part of the organization's objectives or mission. Leaders can also motivate innovation by “walking the walk” and leading by example.
- **A culture of innovation must be intentionally created.** In order to build such a culture, an organization has to be transparent about its appetite for and tolerance of change or disruption. The organization must support and protect those who take the time and the risk to innovate. People have to feel safe to take risks, and thus, the organization and its leaders must support researchers’ choices if they want their scientists to put themselves out there and to be original in their work. In addition to creating this culture of innovation, an organization must foster collaboration, communication, and transparency.

- **Bold leaders are critical to innovation.** We need leaders who are not afraid to make comments or decisions that disrupt the norm. Organizations must “walk the walk” to push the envelope and to reap the benefits of innovation.

- **Failure must be tolerated.** In fact, I would argue that organizations must embrace it. Inevitably, researchers will make mistakes in their quest to move science forward, and lessons will be learned. All of these outcomes can be opportunities for learning and for growth and should not stifle future risk taking.

- **Everyone can be innovative, regardless of their role in an organization.** And innovations do not have to be grand to be impactful. Small steps and changes can lead to significant end results.

- **Motivating people to be innovative can be challenging.** Once you have shared organizational goals and created the culture, you need to follow a people-centered approach to promoting and rewarding innovation.



Bold leaders are critical to innovation.
We need leaders who are not afraid to make comments or decisions that disrupt the norm. Organizations must "walk the walk" to push the envelope and to reap the benefits of innovation.

To expand upon ways that research administration leaders can motivate their teams to be innovative,

I wanted to enlist a few of my colleagues to share their thoughts and insights on this topic. These women serve in senior leadership roles and have demonstrated both innovation and effective leadership time and time again.



Tricia Callahan, MA, CRA
Senior Research Education & Information Officer, Office of Sponsored Programs, Colorado State University



Amanda Breeden, MS
Director of Sponsored Programs and Research, Denver Health and Hospital Authority



Kathryn Starkey, PhD
Associate Dean of Adult Learning, Colorado State University Pueblo

What do innovation and leadership mean to you?

Tricia Callahan: Innovative leadership is providing others the space, support, and flexibility to be creative and to do what brings them joy. By doing so, employees are happier in the work space, which leads to increased productivity and new ideas. I once had a director ask me, "What parts of your job excite you?" [then] allowed me to develop training resources and to conduct grant-writing and grant-administration workshops with our investigators. I am now in a 100% training role and loving it.—Tricia Callahan, Senior Research Education & Information Officer, Office of Sponsored Programs, Colorado State University.

Amanda Breeden: My first thought is that innovation is relative. Each institution is on its own journey. I like

the idea of transformation better for this reason. It also has the perception of being slightly more actionable, while still aspirational (actionable + aspirational = goals!). Leadership is also a word that encompasses so much. But—for me—in short, leadership is distinguished from terms like 'management' by high effectiveness, empathy, and the ability to positively influence and inspire others.

How are you "bold" in your role, and what have you done in your career to disrupt norms and to foster innovation as a leader?

Tricia Callahan: I don't know that I am "bold" inasmuch as I am authentic in the workplace. Authentic me isn't afraid to ask questions or to push against the norm. In addition, I am

willing to try new things and to adjust when needed. Because my career has straddled research development and research administration, because I have worked alongside investigators and administrators, and because I have a broad network and have worked in research-intensive and predominately undergraduate institutions, I have resources and ideas to share—and I don't mind sharing. It's what makes my profession so great!

Dr. Kathryn Starkey: Being bold means reaching out to experts who can offer a new perspective, even if it's outside your organization and challenges the norms that are established already in your organization. In a nonprofit debate organization for which I was the president, I empowered experts in areas like Title IX to redesign policies

and practices, in order to help foster the safety and protection of students in the activity, rather than to conduct business as it was done before.

How do you foster innovation as a leader?

Tricia Callahan: I'm pretty good at identifying people's strengths, then supporting them in trying something new. Newfound feelings of accomplishment and success are often all that is needed for someone to take the next steps on their own. Encouraging people to try new things, then supporting them through the triumphs and failures, often provides all the impetus someone needs to grow.

Dr. Kathryn Starkey: Leaders can facilitate networking opportunities for others; when they make new connections, their staff and peers can share and cultivate ideas that can lead to new prospects for growth.

What can leaders do to motivate others to be innovative?

Dr. Kathryn Starkey: Leaders can demonstrate innovation by example and can allow their staff and colleagues to be part of new projects. At times, [some researchers] can be fearful of innovation and change, but bringing [them in] on new projects and having them play a role, no matter how small, can then give these individuals the confidence to be innovative and open to change themselves.—Kathryn Starkey, PhD, Associate Dean of Adult Learning, Colorado State University Pueblo

Amanda Breeden: Empower the folks doing the work to drive changes to processes. Engage the folks that know the daily work best as well as customers who experience pain points. I work daily towards fostering a culture of continuous improvement and make sure to carve out time for myself and my staff to do this work. In my experience, small incremental change to processes among a nimble work culture leads to true innovation. I believe the cultural aspect is crucial for true innovation. And I cannot understate the power of rewards and recognition for work well done. Do it loudly. Scream it from the rooftops!

While I have a long way to go in my own understanding of effective leadership and innovation, I am committed to continually expanding my knowledge in these two areas as an aspiring leader in my field. I think because of my deep interest in these topics, I tend to be drawn to all professional development opportunities and articles that focus on them. Indeed, my interest has drawn me to putting myself out there and to sharing these thoughts with you. Again, my professional exposure to innovation in action and expert leadership has helped me to truly understand how important these concepts are—in life, science, and in a fast-paced, dynamic field like research administration. And while I am still a novice in how to coach innovation, I am sold on why these critical skills are so crucial and am energized by the potential disruptive innovations that I know my team, peers, and our field are capable of in the years ahead.

In addition to what my bosses, team members, peers, and mentors teach me about leadership and innovation, new insights come from my trusted adviser at home too. She can make a fort out of anything and has a newfound love for tinkering, fueled by attending Innovation Camp this past summer. Recently her elementary school sponsored a "wear a positive message" shirt day, and she wanted to wear her Ruth Bader Ginsberg T-shirt, which says, "Women belong in all places where decisions are being made." If I don't achieve everything I aspire to as a professional in research administration, I take comfort in knowing that my daughter understands the importance of these concepts and will carry her own dedication to leadership and innovation with her into the next generation. 🌟



Nicole Quartiero, MS, CRA, is a seasoned research administration professional with 11+ years of experience in team leadership, clinical and fundamental research, sponsored-programs administration, and overall operations optimization. She is recognized

for her aptitude in strategic planning and process improvement. Currently Quartiero serves in a management role at a research university, overseeing post-award functions. Under her leadership, a team of grant and contract administrators spearhead the full range of post-award operations for a multi-million-dollar portfolio. In addition to her daily work, Quartiero works to identify opportunities for enhancing existing processes, with the goal of finding time- and cost-saving measures.

To Be or Not To Be a PhD Candidate, That Is the Question

By Katie Mitzelfelt, PhD, Lecturer, University of Washington Tacoma
AWIS Member since 2020

Choosing whether or not to work toward a PhD, and then whether or not to finish it, can be very difficult decisions—and there are no right or wrong answers.

Obtaining a PhD is a prestigious accomplishment, and the training allows you to develop your critical-thinking and innovation skills, to conduct research into solving specialized problems, and to learn to troubleshoot when things don't go as expected. You develop a sense of resilience and a commitment to perseverance—skills which are rewarded when that one experiment finally works or when the answer to your long-sought-after question becomes clear. However, finishing a PhD involves a lot of work, time, and stress. It is mentally, physically, and psychologically exhausting.

There are other ways to hone critical thinking and problem-solving skills and many careers that do not require a PhD such as teaching, science policy, communications, technical writing, quality control, and technician work. Opportunities exist in industries from forensics to food science and everywhere in between.

Countering the Stigma of Perceived Failure

Often we mistakenly view a student's decision not to pursue a PhD, or to leave a PhD program, as giving up. Many academics view non-PhDs as not smart enough or strong enough to make it. But this is simply not true. In April 2021 Niba

Audrey Nirmal produced a vulnerable and inspiring video on the topic of leaving graduate school, titled [10 Stories on Leaving Grad School + Why I Left](#), on her YouTube channel, NotesByNiba.

“Everyone is going to have an opinion about whay you do with your life. They’ll have an opinion if you finish your PhD; they’ll have an opinion if you don’t finish your PhD. You have to realize what is best for you.”

In making the video, she hoped to change people's minds by naming the stigma, shame, and guilty feelings that come with leaving a PhD program. She highlights ten stories from others who either completed their PhD programs or chose to leave, and she goes on to

openly share her personal reasons for ending her own doctoral studies in plant genetics at Duke University.

The people showcased in the film share the reasons behind their respective decisions to leave or to stay, as well as heartfelt advice encouraging viewers to make the decision best for them. Participant Sara Whitlock shares, “I decided to leave [my Ph.D. program]... but I still had to kind of disentangle myself from that piece of my identity that was all tied up in science research, and that took a long time, but once I did, I was a lot happier.”

Another participant, Dr. Sarah Derouin, states, “Everyone is going to have an opinion about what you do with your life. They’ll have an opinion if you finish your PhD; they’ll have an opinion if you don’t finish your PhD. At the end of the day, you have to realize what is best for you . . . and then make decisions based on that, not on what you think other people will think of you.” In her film, Nirmal recommends the nonprofit organization [PhD Balance](#) as a welcoming space for learning about others’ shared experiences.

A Personal Choice

So, do you need a PhD? It depends on what you want to do in your career and in your life. It also depends on your priorities—money, family, free time, fame, advancing science, curiosity, creating cures, saving the planet, etc. (Note that what you value now may shift throughout your life. Your journey will

not be a straight line: every step you take will provide an experience that will shape who you are and how you view the world.)

Your decision whether or not to pursue a PhD should be based on your specific goals. Whether or not you obtain a PhD, remember that your journey is unique. The breadth of our experiences as scientists is what yields the diverse perspectives necessary to tackle the world's difficult problems, now and in the years ahead.

The stories below, based on my own interviews, provide examples of the personal experiences and career choices of some amazing and inspiring scientists. Some of them decided to skip further graduate studies; some chose to go the whole distance on the PhD route; and still others left their doctoral programs behind.



**Mai Thao,
PhD, Medical
Affairs,
Medtronic**

Dr. Mai Thao learned what a PhD might entail during a summer research stint at the

University of Wisconsin–Madison, when she was an undergraduate. “Being a first-generation immigrant and first-generation college student, my knowledge of working/professional life was limited to assembly lines and retail. The autonomy I had that summer appealed to me. I also learned about the economics of a bachelor’s degree versus those for a master’s degree and PhD. I ended my research summer knowing that I would pursue a graduate degree, perhaps later in life,” she says.

After completing her undergraduate degree, Dr. Thao worked in a private sector lab. She shared “work was

physically exhausting, with little reward. I had no autonomy; instead, I entered a production line similar to the ones that my own parents had endured to provide a living for my family.” While the studies she was working on were important, Dr. Thao felt her contributions to those studies, were minimal. She asserts, “Being naive and a bit arrogant, I thought at that time that I was clearly made for better and greater things, so I quit right in the middle of the Great Recession [2007–2009].” She then pursued a master’s degree in chemistry from California State University, Sacramento, and went on to complete her doctorate in chemistry and biochemistry at Northern Illinois University. Dr. Thao reflects, “In retrospect, I knew that having a PhD would offer me better opportunities and ones with true autonomy.”

When asked how satisfied she is with her decision to complete the doctoral program, Dr. Thao says, “I go back and forth about being satisfied with my decision . . . I was clueless about financing college and even declined multiple schools that offered me full academic scholarships. Today I slowly chip away at my financial error. On the other side, I do have a PhD and can afford to chip away at my mountain of student loan debt. I am also fortunate to be able to really live in the present, to save for the future, and to give.”

Today, Dr. Thao is a scientific resource consultant for internal partners and external key stakeholders at Medtronic. She says, “My day-to-day can range from providing evidence from the literature to supporting scientific claims for marketing purposes. My favorite part of my job is being able to add scientific value to the projects I support. It’s always so rewarding to see how

the ideas of engineers and scientists materialize and then to see how the commercial team takes it to market to make a great impact on patients, and I get to see the entire process.”



**Tam'ra-Kay Francis,
PhD, Department
of Chemistry,
University of
Washington**

Dr. Tam'ra-Kay Francis received a master’s in chemistry from Fisk University,

after which she began teaching undergraduate introductory chemistry courses at her alma mater. While contemplating whether or not to pursue a doctorate, she identified her enthusiasm for teaching and mentoring underrepresented students. A friend observed that she could teach thirty students at a time with a master’s degree, but a PhD might allow her to design educational programs which would reduce barriers and expand access for greater numbers of underrepresented students. Dr. Francis went on to complete a PhD in Education from the University of Tennessee, Knoxville. “No regrets,” says Dr. Francis, referring to her decision to complete a doctorate.

Dr. Francis currently works as a postdoctoral scholar in the chemistry department at the University of Washington. Her research examines “pedagogies and other interventions in higher education that support underrepresented students in STEM. [My] efforts engage both faculty and students in the development of equity-based environments.” She is currently investigating the impact of active learning interventions in the Chemistry Department.

Dr. Francis acknowledges that deciding to pursue a doctorate is a very personal

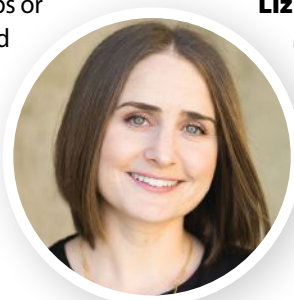
decision. “There are so many things to consider— time, finances, focus area, committee expertise and support, and next steps,” she says. “Not every job requires a PhD, so it is important to stay informed about the expertise required for a career that you are considering.”

She provides advice to prospective graduate students, telling them to do their due diligence when seeking out programs that are right for them. “When interviewing with potential advisers, don’t be afraid to ask specific questions about things that are important to your success. Ask them about their expectations (for example, their philosophies on mentoring and work-life balance) and about the types of support they provide (for example, help with research funding, mental health, and professional development).”

She also suggests reaching out to graduate students in the groups or departments you are interested in. “Ask them directly about what the culture is like and about how they are being supported.” She wants to remind students that they do have a voice and a say in their graduate career. “Your needs will change throughout graduate school, so it is important that you find advocates, both within and outside of your institution, to champion you to the finish line. It is very important that you build your network of support

as early as possible,” says Dr. Francis. She credits her adviser, mentors, committee, and former supervisors as being crucial supports in her journey.

“In the first year of my doctoral program, I found an amazing community of scholars from a research interest group (CADASE) within the National Association of Research in Science Teaching. It was a great space to find mentors and build connections in a large professional organization,” said Dr. Francis. At the institutional level, Dr. Francis served as vice president of the Graduate Student Senate and was a member of the Multicultural Graduate Student Organization. For Dr. Francis, her participation in these groups and organizations contributed to her professional growth, sense of community, and success in graduate school.



Liz Goossen, MS, Senior Marketing Specialist at Adaptive Biotechnologies

Liz Goossen received her master’s in oncological sciences from the University of Utah. She has worked in marketing for molecular diagnostic companies during the past four years and remarks that “the skills [she] gained in research, data analysis, and perseverance while in graduate school have served [her] very

well.” Goossen shares, “All of my roles have included collaboration with the lab and medical sides of the companies, and I believe my scientific background has facilitated more trust and better communication with these groups.”

Reflecting on her decision not to pursue a doctorate, Goossen acknowledges, “I spent a lot of time in graduate school researching potential career paths one could do with a PhD, [and even organized] a career day featuring a dozen speakers from across the country in a variety of scientific fields. By the end, I felt that none of these career options would be a good fit for me (or at least not a good enough fit to warrant five or more years in my program). I worried about going through all of my twenties without starting a 401(k) or having normal working hours, and [I also worried about] all of the other trade-offs there are between finishing a PhD and joining the workforce. I lived in Salt Lake City at the time, and the job market was flooded with PhDs who were overqualified for many of the available positions. By leaving [school] with a master’s, I had more options.”

When asked if she is satisfied with her decision, Goossen says she is 99% satisfied. “There are times I encounter jobs requiring a PhD that look enticing, and [that’s when] I wonder if it may have been nice to have one, but those moments are rare.”

“Your needs will change throughout graduate school, so it is important that you find advocates, both within and outside of your institution, to champion you to the finish line. It is very important that you build your network of support as early as possible,”

“[A doctorate] is a long-term commitment. If your goal (or passion!) is a lifetime of leading independent research (with or without teaching), a PhD will help to broaden your available opportunities and will open doors for you [but it can also] delay your career trajectory and salary growth.”



**Maureen Kennedy,
PhD, Assistant
Professor,
University of
Washington
Tacoma**

Dr. Maureen Kennedy earned a master's and a doctorate in Quantitative

Ecology and Resource Management, an interdisciplinary graduate program at the University of Washington. In collaboration with researchers in the Fire and Environmental Research Applications team (U.S. Forest Service, Pacific Northwest Research Station) and with an interdisciplinary team at the University of California, Santa Barbara, she utilizes an array of quantitative methods to help advance our understanding of landscape fire ecology, fuel treatment effectiveness, fire-spread modeling, and interactions among hydrology, fire, carbon, and climate change.

Dr. Kennedy shares that a major factor in her decision to complete a doctorate was the financial support she received. She says, “I was able to maintain funding through research agreements and occasional teaching opportunities that I loved! This consistent funding allowed me to enjoy the freedom of pursuing my

PhD on research I found very fulfilling, while also gaining valuable teaching experience. I always felt at home in an academic setting and was happy to stay there while being supported.”

Dr. Kennedy reports being very satisfied with her decision to pursue a doctorate and attributes this satisfaction to knowing that she is making “an impact, both through teaching new generations of students and through being able to continue to pursue [her] favored research topics.” She reflects on some of the positive and negative impacts of her decision:

“As a PhD, I am able to direct my own research agenda with relative independence. One major trade-off is that by pursuing an academic career, my salary is likely less than I could get in the private sector with the same skills. My lifetime cumulative salary will also likely be less, due to the years living off of research and teaching stipends, rather than [benefiting from] full-time employment and salary. Also, my years spent as a research scientist funded by soft money, or periodic research grants, were often uncertain; when one grant was winding down, [I had to pursue] new grants.”

Dr. Kennedy remarks that as a tenure-track professor, she has diverse daily activities, which she finds appealing. She shares, “Some days are focused on teaching (particularly during the academic year), some days on research (particularly during the summer), and some days I am able to do both. Before the pandemic, I would come to campus several days a week, but I was also able to work from home on other days. Days are often filled with lectures and office hours, or meetings with research collaborators. I carve out times to focus on reading and writing when I can and when deadlines are approaching. It is definitely a balancing act of time management and of planning, to ensure I am able to fulfill my teaching and research commitments.”

Dr. Kennedy advises that a doctorate “is a long-term commitment. If your goal (or passion!) is a lifetime of leading independent research (with or without teaching), a PhD will help to broaden your available opportunities and will open doors for you.” She cautions that a PhD can “delay your career trajectory and salary growth,” and so she suggests that you carefully research career opportunities and requirements to see if a doctorate makes sense for you.



**Olivia Shan, BS,
Restoration
Coordinator
at Palouse–
Clearwater
Environmental
Institute**

Olivia Shan

has a bachelor's
degree in natural

resource conservation science and is a Restoration Coordinator at Palouse–Clearwater Environmental Institute. Shan shares her typical day as follows: “I start the day out by watering our 3,500 plants and observing them for any pests/diseases. I then do some light landscaping work for [members of] the public, who take strolls through our nature center. Next, over my second cup of coffee, I explain the tasks for the day to our AmeriCorps participants and then assist them. My tasks vary greatly: one day I will be meeting with the Idaho Department of Environmental Quality to discuss water quality, and the next day I will be explaining the benefits of beavers to fifth graders!” She heads many riparian restoration projects in the region, work that requires her to collaborate with landowners, the Forest Service, and Conservation Districts.

Shan attributes her decision not to pursue a graduate degree to cost, lack of time, and uncertainty about what to focus on. She remarks that at some point, she may decide to continue her education, but only if she receives full funding to pay for it. She says she is very satisfied with her decision to enter the workforce right after finishing her undergraduate studies. “After earning my bachelor’s, I worked as a wildland firefighter [and] did [other] jobs I found fun,” says Shan. “Not having any debt after college gave me the flexibility to do what I desired and to explore options. I am all for taking a break from academia

“After earning my bachelor’s, I worked as a wildland firefighter [and] did [other] jobs I found fun,” says Shan. “Not having any debt after college gave me the flexibility to do what I desired and to explore options.”

and for actually trying out jobs before [narrowing your] focus too far. It would have been a real bummer to spend years on [graduate work I thought I was interested in pursuing] and then later to realize that [this] was not at all what I wanted to do.”

Shan shares that she “adore[s] the diversity of [her] job, and the feeling that [she] is truly helping the environment [and her] community.” She encourages others: “Follow your heart, because you can make a difference no matter your education level. It all comes down to passion, drive, and work ethic!”



**Morgan Heinz, MS,
Assistant Teaching
Professor,
University of
Washington
Tacoma**

Morgan Heinz completed his bachelor’s degree, taught English in Japan for two years, and then applied to study in master’s-degree-only programs. He says, “[I was] very specifically

look[ing] for institutions that didn’t grant PhDs, because I didn’t want to be pushed to the side [while advisers spent] more time on the doctoral candidates.”

After completing his master’s degree, Heinz began applying to PhD programs, using the network and interests he had already developed in his previous graduate studies. He could not yet see any other paths for himself. He also wanted to teach college courses and saw the doctorate as the only way to accomplish this goal.

He called and emailed students in the lab to ask them what the environment is like. He received very candid responses and ruled out some labs as a result.

Once he started the PhD program, Heinz found that his doctoral adviser was much more hands-off than his master’s adviser had been and required an unexpected level of independence. This less-directed environment was difficult for Heinz to thrive in. He acknowledges, “I did not have the skill of looking at where the science is, looking for gaps, and seeing how I could contribute.”

These early stages of the PhD process helped him crystallize his passions. He realized that he loves learning and teaching, but he didn’t like synthesizing the literature and determining the next question to ask.

Heinz ultimately decided to take a short hiatus from the doctoral program and taught classes. This interlude reaffirmed his passion for teaching and helped him decide to leave his graduate studies behind.

When he first decided to leave the program, he felt like he was giving up, was worthless, and was a failure. Through continued reflection, he realized, “the side routes that I have taken have actually made me stronger as an instructor.”

After leaving the PhD program, Heinz participated in a community college faculty training program and was hired before even finishing it. He says that the community college allowed anyone to enroll, which was philosophically satisfying and emotionally fulfilling, enabling him to offer an education to any student who wanted it.

Heinz tries to impress upon his students that there are a lot of different paths in life. He states, "I don't have a PhD, and I am exactly where I want to be."

If you are considering a PhD or masters program, Heinz suggests looking to see if they offer health insurance and mental health services -- because graduate school can be stressful and depressing. Many programs may even pay a stipend for you to attend. Heinz also advises, "Don't be afraid to change your mind. Draw some boundaries."

Finally, Heinz adds, "Don't be apologetic about the things that you're interested in and are excited about, even when people tell you that that's not an arena for you, because of how you look or who you are. If you're interested in it, then that's yours, and you can own it. You don't need a PhD to validate that interest. You don't need a PhD to prove your worth in that field. Life is too short to not pursue the things that excite you."

There Are No Wrong Answers

Whatever decision you make, know that it is the right one for you in the here and now. You may grapple with disappointment or frustration along the way, but regret will

"Don't be apologetic about the things that you're interested in and are excited about, even when people tell you that that's not an arena for you, because of how you look or who you are. If you're interested in it, then that's yours, and you can own it."

not help move you forward. Be grateful for your journey and for how it helps you grow.

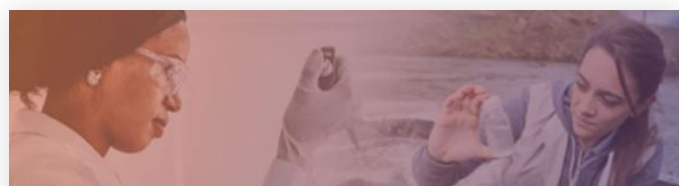
Listen to stories and advice, but make the choices that feel right for you. Your story is not the same as anyone else's. What is right for them, may not be right for you. Be the author of your own life. Your story is beautiful, and you are worthy of living it.

Acknowledgments

A special thank you to Niba Audrey Nirmal, Multimedia Producer & Science Communicator, NotesByNiba, and to Brianna Barbu, Assistant Editor, C&EN, for their thoughtful edits and suggestions on this article.



Dr. Katie Mitzelfelt is currently a biology lecturer at the University of Washington Tacoma. She received her PhD in biochemistry from the University of Utah and researched cardiac regeneration as a postdoctoral fellow at the University of Washington Seattle, prior to transitioning to teaching. She identifies as an educator, content designer, writer, scientist, small business owner, and mom.



AWIS NEWS BRIEF

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AWIS
ASSOCIATION FOR WOMEN IN SCIENCE

Science, Accessibility, and Advocacy

By **Syreeta Nolan**, Co-founder and CEO of Disabled in Higher Ed

As a disabled scientist, I must balance my research and health. I live with chronic pain and have to manage my [spoon](#) levels, or mental and physical energy I have, from day to day. I have spent nineteen years in undergraduate studies where a thesis is all I need to complete my bachelor's degree in human health psychology at the University of California San Diego (UCSD).

Little did I know when starting lab work at UCSD that I was also starting down the path of advocacy. For example, there was a point when I requested a low-pressure pipette. Sadly, I never received a different pipette, and working at the bench never became accessible for me, but I did get better at advocating.

I successfully taught myself how to engage in [systematic reviews](#) by learning how to leverage [UCSD's Systematic Review Service](#). Now, as a project manager of two research teams, I have four reviews in progress and won the [Undergraduate Library Research Prize](#).

I discovered my voice and continued to pursue advocacy on campus- and system-wide levels as an Underrepresented Student Officer for the [University of California Student Association](#). At one point, I was told that I was doing too much advocacy and should just focus on research. But I ignored this advice and followed my heart, and I was honored to win the 2020 [Inclusive Excellence Award at UCSD](#).



During my undergraduate years, I followed my principal investigator (PI) into the Twitter-verse, where I found other disabled students and researchers. I was excited to finally have a community and ultimately co-founded [Disabled In Higher Ed on Twitter](#), a community of 8,932 people and counting.

After experiencing medical trauma last year, I only applied to a few graduate programs. I received the puzzling feedback that they didn't know if I was more interested in research or advocacy. This still feels like a false choice to me: why should I be forced to pick one or the other? Research and disability advocacy can and do coexist.

Gaining true accessibility requires each disabled student to advocate for their needs, so that they can do the science they are passionate about. This advocacy is only the beginning of the journey as students need supportive leadership. Existing attitudes must change where sole responsibility is placed on the student to find funding and research proper accommodations. Their doctors, disability office, program/administration, and PIs are also responsible for accessible lab spaces, otherwise ableism results, and applies at all levels for disabled scientist.

Disability advocacy on a CV is not a weakness or a distraction; it is a strength to be harnessed. Each person who engages in disability advocacy has a network and knows how to deliver information to that network. This skill is evidence of our ability to disseminate academic research and use our network to generate opportunities furthering our scientific work. In fact, getting into programs or obtaining grants require self-advocacy. Let's end the stigma that advocacy skills are not valuable. 🧠

Syreeta Nolan is a disability justice advocate. She serves as co-founder of *Disabled in Higher Education* on Twitter, as founder of JADE (Justice, Advocacy and Disability Education), and as a board member of Health Advocate X. She will earn her bachelor's in human health psychology from the University of California San Diego later this year and plans on pursuing a PhD in health or public policy.

Ph.D. FELLOWSHIP OPPORTUNITIES



ELIGIBILITY: U.S. CITIZENS WHO ARE SENIOR UNDERGRADUATES OR STUDENTS IN THEIR FIRST OR SECOND YEAR OF GRADUATE STUDY.

The Department of Energy National Nuclear Security Administration Stewardship Science Graduate Fellowship (**DOE NNSA SSGF**) provides outstanding benefits and opportunities to students pursuing degrees in stewardship science areas, such as **properties of materials under extreme conditions and hydrodynamics, nuclear science, or high energy density physics.**

The fellowship includes a 12-week research experience at Lawrence Livermore National Laboratory, Los Alamos National Laboratory or Sandia National Laboratories.

APPLICATIONS DUE 1.5.2022
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ELIGIBILITY: U.S. CITIZENS WHO ARE ENTERING THEIR SECOND (OR LATER) YEAR OF GRADUATE STUDY.

The Department of Energy National Nuclear Security Administration Laboratory Residency Graduate Fellowship (**DOE NNSA LRGF**) gives students the opportunity to work at DOE NNSA facilities while pursuing degrees in fields relevant to **nuclear stockpile stewardship: engineering and applied sciences, physics, materials, or mathematics and computational science.**

Fellowships include at least two 12-week research residencies at Lawrence Livermore, Los Alamos or Sandia national laboratories, or the Nevada National Security Site. Fellows are encouraged to extend these stays to conduct thesis research and other studies at the facilities.

APPLICATIONS DUE 3.16.2022
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These equal opportunity programs are open to all qualified persons without regard to race, gender, religion, age, physical disability or national origin.



U.S. DEPARTMENT OF
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Federal Grant Reporting of Sexual Harassment in Extramural Settings: August Webinar Recap

By **Jade Forde**, AWIS Marketing Specialist

As we know, harassment can exist in any business, education, and community setting. It is not often that you learn about cases of harassment in extramural research settings. Why is that a niche area that has not been highlighted? How do those situations play out in terms of justice for the victims? In August 2021, AWIS hosted a webinar that added some pieces to the puzzle, featuring senior counsel Kristen Schwendinger: [Could Federal Grant Requirements to Report Harassment Really Change Behavior?](#) (Click the link to login and view the recording!)

Grant requirements to report harassment coexist with and often add to a university's official code of conduct. Taking on this topic, Schwendinger covered the grant reporting requirements of three federal agencies: the National Aeronautics and Space Administration (NASA), the National Science Foundation (NSF), and the National Institutes of Health (NIH). Each agency has different requirements and different definitions for what constitutes sexual and other forms of harassment.

Schwendinger explained that NASA requires that any finding of harassment or of sexual assault involving a NASA-funded Principal Investigator (PI) or co-PI be reported within ten days of the finding or of the start date of administrative leave/action.

The NSF requires that any finding of harassment or of assault be reported within ten days of the finding or of the



Senior counsel Kristen Schwendinger featured at August Webinar.

start date of administrative leave/action, whichever is sooner. The NSF requires this reporting even if the harassment or assault occurred outside the scope of the NSF award.

The NIH requires that any change in the status of the PI or of other senior, key personnel, due to a finding of harassment or assault, be reported within thirty days.

Schwendinger asserted that Congress does not want to continue to fund or support perpetrators of harassment, and wants to prevent them from leaving one institution and taking a job at another.

She further explained that federal agencies want to protect the research, because unsafe environments can undermine the science.

When reviewing these agency requirements, it may be easy to view them skeptically and difficult to believe that universities are working quickly to remove perpetrators and to protect victims. In actual practice, a victim is sometimes simply moved to a different department while an investigation is occurring.

Schwendinger stated that agencies are loathe to take away research

funding, since this action impacts many people, not just those who perpetrate harassment. But these agencies believe that putting grant funding at risk is one way to change behavior and to encourage compliance.

This goal still hinges on how motivated universities are to report instances of harassment to the federal agencies. Institutions may still be hesitant to report these issues and to put funding at risk. In the case of the NIH, victims can report directly on the agency's website and maintain their anonymity. But this option does not apply to all agencies, which may impede reporting efforts.

Unfortunately, institutions do not tend to publicly announce these removals and/or openly share the names of those individuals with other institutions. It is possible for a perpetrator to be fired from one institution and hired by another, especially if the funding

agencies are different. One solution could be a central database across all agencies. This would allow institutions and agencies to ensure a safe and equitable workplace while safeguarding the research.

To put things into perspective, since 2018, the NIH has received more than three hundred reports of sexual harassment. As of June 10, 2021, seventy-five investigators identified in these reports have been removed from their grant-funded projects. This is a small step, and much more should be done.

Every day is another chance to make a positive change in the world and in our personal lives. If you are in an extramural research setting, please note the following: 1) know the harassment reporting requirements of your funding agency, 2) do not be afraid to speak out against sexual harassment, or against

other harassment or bullying, and 3) continue to push for justice. Every effort contributes to the big-picture of equitable and safe workplaces for everyone. ✨



Jade Forde joins AWIS as a Marketing Specialist. The New York City native graduated from George Mason University with a B.A.

in Communications. Jade led marketing for an IT government contractor until her expertise led her to the nonprofit sector. She has experience in social media, content creation, website maintenance, online communities, graphic design, newsletters, and email marketing. In Fall 2021, she will pursue a master's degree in Digital Strategy from the University of Florida. Jade lives in Northern Virginia with her puppy Theodore.



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AWIS Recognizes Coe College Physics Major Makyla Boyd



*Meet Makyla Boyd,
the 2021 recipient of the AWIS
Kirsten R. Lorentzen Award and
a senior physics major at Coe
College in Cedar Rapids, Iowa.*



Makyla holds a meteorite at her first conference in Washington, DC.

What inspired you to study physics?

Growing up, when I thought about what I would be or what I would do, all I knew was that I wanted to help people. I was also always interested in science, so I eventually decided that I would pursue engineering. It wasn't until my junior year of high school that I took my first physics class with Ms. Erin Mulanax. She helped me realize that science is about learning and that it is okay to ask for help. I decided I would major in physics as a college student while taking time to figure out which engineering discipline I wanted to pursue in graduate school.

What is one of your proudest moments so far in your STEM journey?

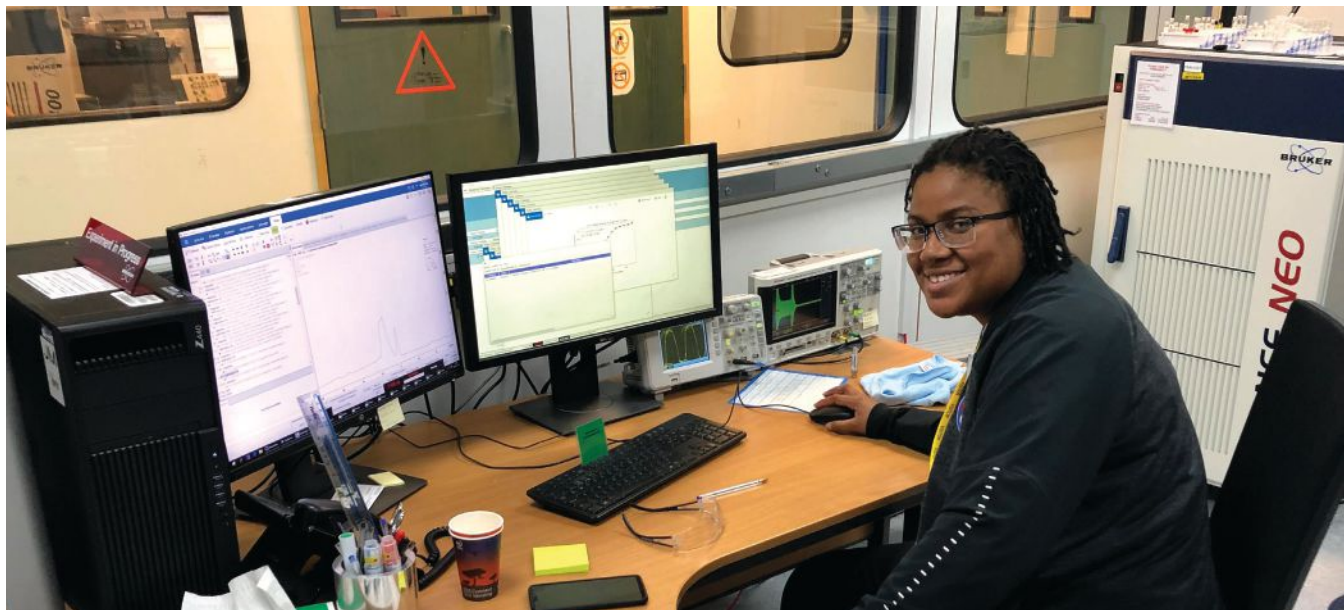
My first physics exam in high school was not great. But instead of giving up, I went to Ms. Mulanax for extra help every Thursday. When the next exam came, I aced it! It may have been a small moment, but without it, I wouldn't have had the confidence or passion to continue in physics—and even now, to do research at places like Caltech, where I just spent the summer completing a WAVE fellowship.

Who has influenced you along the way?

In high school, my main influence was that same encouraging physics teacher, Ms. Mulanax. As I moved on to college, Dr. Steven "Doc" Feller, professor of physics at Coe College, became an integral part of my undergraduate experience. Doc, from early on, proved himself to be a research adviser who truly cares about his students. He shaped me as a researcher,



Makyla at Caltech as a WAVE fellow in summer 2021.



Makyla conducting Nuclear Magnetic Resonance (NMR) experiments in England.

including trusting me as a freshman to travel to England and Greece to work with his collaborators. His confidence in both my hard work and my dedication has made a lasting impact, as it has shown me that a career in research is possible for me.

Another influence has been Dr. Mario Affatigato, chair of the physics department at Coe College, who also showed a lot of faith and belief in me early on. Dr. Affatigato helped me obtain outside scholarships that made college affordable for me, and he has given me opportunities to utilize my leadership skills throughout the department.

I've been fortunate to have many additional influences, including physics professors Dr. Firdevs Duru and Dr. Ugur Akgun. As a woman in STEM, Dr. Duru was a natural fit as a role model, sending me to my first conference so that I could learn more about her area of research. Dr. Akgun is a ball of positive energy, who welcomes new physics majors and made my transition to college less stressful.

What advice would you give other young women who are interested in STEM?

1) Never stop working hard, because hard work opens the same doors as natural ability. 2) If you need help, get help. 3) No one starts their journey or career the same way, so never be discouraged when you look at where you are with respect to others. 4) All it takes is at least one person to believe in you, even if that one person is yourself.

What is your dream job?

My dream job would involve working with a team to solve problems and to help other people. I honestly haven't thought about my dream job or career too much, since I like to take everything one step at a time and just do my best. I never want to close myself off from any potential opportunities, so I tend to keep my options open and to see where life takes me. ★

About the awardee: Makyla Boyd is a senior at Coe College pursuing a degree in physics. She is also involved in the music program at Coe. She is the current president of Coe College's Physics Club, vice president of the

WinSTEM Club, and secretary of the Mu Phi chapter. This past summer, she completed a WAVE fellowship at Caltech which aims to foster diversity by increasing the participation of underrepresented students in science and engineering Ph.D. programs and making Caltech's programs more visible and accessible to students not traditionally exposed to Caltech. She plans to continue her education by going to graduate school and earning a Ph.D. in either material science or mechanical engineering.

About the award: The Kirsten R. Lorentzen Award is an AWIS Educational Foundation program for women who are college sophomores and juniors studying physics, including space physics, geophysics, or geoscience. The award is given annually to an exceptionally well-rounded student who excels in her studies, as well as in outdoor activities, service, sports, music, or other non-academic pursuits, or who has overcome significant obstacles. The award is administered by the Society of Physics Students and may be used for any aspect of education. Applications for the AWIS Kirsten R. Lorentzen Award will open again in early 2022.

Progress and Planned Action for Advancing an Antiracist Research Lab Network

By Vivian Villegas, OTD, OTR/L; Zurisadai Salgado; Julia Sim; Vera Kaelin, MSc, OT; Jessica Jarvis, PhD, MT-BC; Michelle Phoenix, PhD, CASLPO; and Mary Khetani, ScD, OTR/L

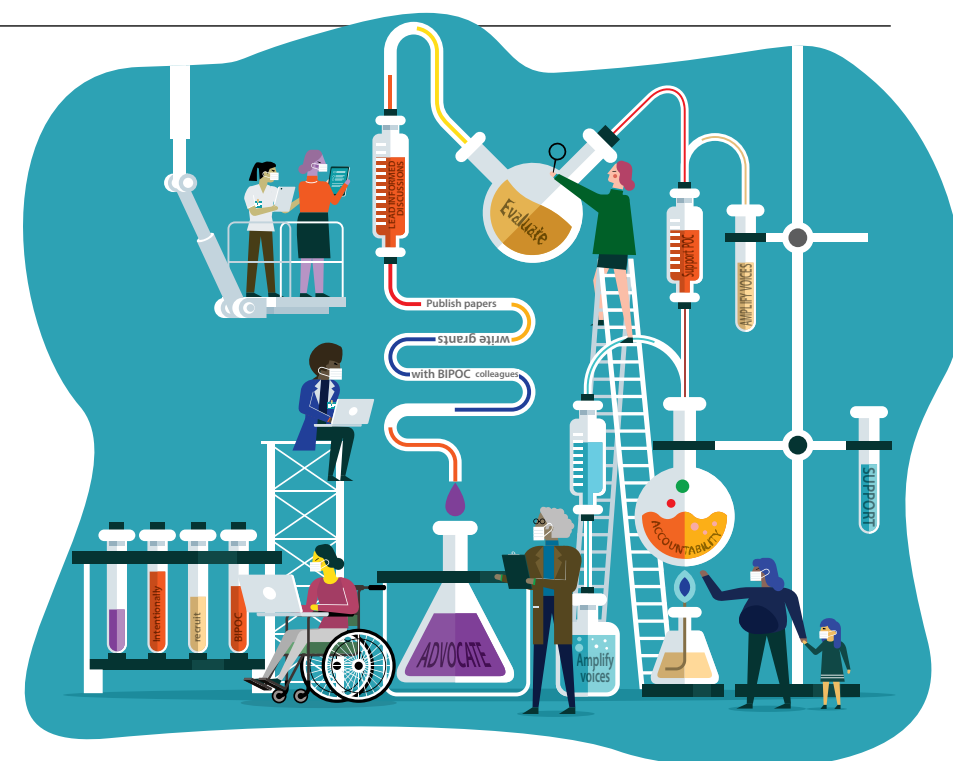
Our Action Plan for Building an Antiracist Research Lab

*"All that glitters is not gold.
It's blood. It's tears. It's sweat.
My glitter is made up of pain,
sacrifice and hard work"*
— Bozoma Saint John

One year ago, our Black, Indigenous, and People of Color (BIPOC) majority research team embarked on a journey to shape an antiracist research environment. Our reason for doing so is because academic research labs that train talented and committed students for careers as research-engaged clinicians and career scientists can be instrumental in promoting racial equity. We were guided by Chaudhary and Berhe's (2020) ten rules to create an initial antiracist action plan ([see Table 1 on page 50](#)), with action steps for cultivating a more diverse, equitable, and inclusive (DEI) research lab environment. Here we outline our original action plan, reflect on steps taken to date to guide our action planning, and illustrate examples for how this work can be scaled to build an antiracist research lab network (Villegas et al., 2020).

Reflections on Our Progress and Lessons Learned

Lab Director Mary Khetani's Perspective
I was mentored to know that BIPOC leaders often leave things better than they found them, all while being 150% to be seen as 100%. As a BIPOC lab director, I chose to take a



risk in strategically reallocating lab resources to antiracist work, while struggling to make ends meet (e.g., delaying essential research equipment repairs, seeking deadline extensions). I hypothesized that if trainees had space to learn and to apply the vast vocabulary of overt and covert racism (e.g., tone policing, gaslighting), they could be better prepared to label such behavior and to think twice when considering how (*not if*) they respond to it.

We codesigned our process for selecting topics and sharing resources to prepare for courageous conversations (CC), guided in part by AWIS's antiracist resources, and we established ground rules for enacting CC. Yet, these shared resources lacked

exemplars specific to an academic lab environment, making it difficult to check and apply knowledge of learned concepts.

I decided to fill this gap by contributing case examples. Lab members were then challenged to diagnose my case scenarios and to brainstorm multiple response strategies. The time we invested in this exercise paid off, as I later witnessed one lab member, an invited panelist on a Zoom session about 'belonging', demonstrate authentic allyship by fact-checking a senior colleague, who prioritized White voices as experts. This act of authentic allyship caused senior colleagues to emulate the behavior and to hold others accountable.

It has been a struggle to afford and promote CC on a formal, quarterly basis as planned. In response, trainees are integrating CC into our routine work, such as in journal clubs and manuscript reviews, to sustain this valuable work. Also, I did not anticipate that sharing case scenarios would trigger personal racial trauma and would challenge my own boundaries. Yet, I realize my position enables me to set the tone. I did not initially want to draw on my own experiences to both experience and educate others about racism, but I now realize that I must try to do my part, to the extent tolerable, so as to train those who will outlast me.

Lab Member Perspectives

Four of the five lab members who enacted the lab's strategic plan this past year share reflections about their most impactful experiences in the summaries that follow:

Vivian Villegas, Rule 9: I treasure our CPERL research team members, who served not only as great mentors but also as strong allies as I embarked on my career as a research-engaged practitioner. I acknowledge that our lab has a purposeful model of assigning credit for contributions, which has allowed me to earn manuscript authorship and credited roles on grants. However, I have learned these contributions are not guaranteed and also the importance of holding colleagues accountable for earning and accurately stating their authorship. These opportunities have significantly shaped my career trajectory, such that I now look for ways to serve as an ally for other BIPOC members in my work environments (e.g., nominating BIPOC paraprofessionals for employee of the month).

These opportunities have significantly shaped my career trajectory, such that I now look for ways to serve as an ally for other BIPOC members in my work environments.

Zurisadai Salgado, Rule 8: Our antiracist journey at CPERL has piqued my interest in diversifying the beneficiaries of our assessments and interventions. I have been introduced to cultural adaptation and am helping to upgrade an electronic assessment by introducing select antiracist terms that might prompt caregivers to initiate disclosure of their experiences with racial inequity, so that these barriers can be considered by their child's service provider team when designing a service plan. We plan to get caregiver feedback on these upgrades. I will take what I learn from this phase of work to design and conduct a doctoral project that advances my vision of empowering underrepresented communities with quality tools that they find accessible. I am both excited and nervous to step into this work.

Julia Sim, Rule 1: Our most recent CC at CPERL addressed microaggressions and implicit bias. It was eye-opening to apply our learning to the case of women scientists transitioning into parenthood, including my

lab mate, who was undergoing her own transition during this time. We discussed opportunities for bystander intervention (e.g., speaking up against comments/inquiries made about when a given email is being sent and/or when a colleague's baby is going to be brought into the lab. I also facilitated a discussion during my first journal club about identifying gatekeeping behavior and holding colleagues accountable for scientific integrity, for example, ensuring that authorship arrangements do not minimize BIPOC contributions. I am becoming more aware of expectations that I have put on myself and minoritized groups around me, and I continue to unlearn old stereotypes. Moving forward, I want to continue having conversations about these rarely talked about topics, which we actually experience every day.

Vera Kaelin, Rule 7: Following a CC about covert racism and an upgrade to CPERL's own onboarding process (see Rule 7 in Table), I have reflected on recruitment/onboarding processes in research labs, both domestic and international. Many of my friends abroad have asked me about racism in the United States, thinking—as I once did too—that this is a U.S. problem. However, racism can have different faces in different countries (e.g., implicit biases revealed during recruitment that disadvantage people with foreign-sounding names). As a Swiss American pursuing a research career, I am becoming more sensitized to the importance of pushing labs, both within and outside of the United States, to engage with these topics addressed. These efforts are significant and don't guarantee recruitment/retention success, yet they can have significant impact for those with similar aspirations but less privilege.

Table 1. Children's Participation in Environment Research Lab's Antiracist Action Plan and Progress

Rule (Chaudhary & Berhe, 2020)	Action step(s) proposed	Progress to date
1. Lead informed discussions about antiracism in your lab regularly.	<ul style="list-style-type: none"> Expand lab meetings and retreats to routinely include courageous conversations about racism in academia, to build vocabulary and habits for action. 	<ul style="list-style-type: none"> We compensated lab members for their time to prepare for and take part in three courageous conversations.
2. Address racism in your lab and field safety guidelines.	<ul style="list-style-type: none"> Create lab apparel (e.g., mask with lab logo). Establish a group text-messaging system for inclusive communication. Adopt a formal buddy system for onboarding. Outline safety procedures in lab handbook, including what to do and whom to contact if you experience or witness racism. 	<ul style="list-style-type: none"> We adjusted our lab handbook's code of conduct to better welcome BIPOC members as equal lab partners. Two BIPOC lab members created lab masks and a onesie with lab logo to foster a welcoming environment for all members. We established a group text-messaging system for inclusive communication.
3. Publish papers and write grants with BIPOC colleagues.	<ul style="list-style-type: none"> Invite BIPOC scientists to co-lead in research and dissemination activities. Invest more lab resources into BIPOC-run businesses. Formally acknowledge BIPOC colleagues on deliverables to publicize their contributions. Include a photo of lab members being acknowledged in lab website posts and social media dissemination. 	<ul style="list-style-type: none"> We invested lab resources with two BIPOC vendors to upgrade design and functionality of two electronic tools. We formally acknowledged one BIPOC business on a refereed publication and budgeted them into two outgoing grants. Two BIPOC team members were formally written into a sponsored contract renewal.
4. Evaluate your lab's mentoring practices.	<ul style="list-style-type: none"> Collaborate with lab alumnae and scholars external to the lab in ways that are of mutual benefit (e.g., invited talks, lab dinners at conferences, and invitations to serve as committee members). 	<ul style="list-style-type: none"> Two BIPOC lab members sought lab alumnae for paid consultations and/or credited roles on a refereed publication and capstone project.
5. Amplify voices of BIPOC scientists in your field.	<ul style="list-style-type: none"> Consistently find, share, and cite our lab's work and those of our BIPOC colleagues. 	<ul style="list-style-type: none"> We added NameCoach links to our email signatures and lab website. We requested citations of our lab's work and those of our BIPOC colleagues on multiple manuscript reviews.
6. Support POC in their efforts to organize.	<ul style="list-style-type: none"> Identify and create affinity peer groups. 	<ul style="list-style-type: none"> Develop safe spaces within weekly/biweekly mentorship meetings and/or lab buddy relationships to process and debrief issues surrounding race without retribution.
7. Intentionally recruit BIPOC students and staff.	<ul style="list-style-type: none"> Seek BIPOC lab member input when examining recruitment strategies. Add DEI statements to recruitment and hiring materials. 	<ul style="list-style-type: none"> A BIPOC team member recorded a "CPERL 101" narrated PowerPoint to guide asynchronous self study for new members (peer to peer). We sought BIPOC lab member input for recruitment (e.g., adding DEI statements to our recruitment and hiring materials).
8. Adopt a dynamic research agenda.	<ul style="list-style-type: none"> Diversify our assessments and interventions to assess for racial climate. Amplify and better credit BIPOC contributions when recruiting, enrolling, retaining, and describing sample participants in upcoming intervention trials. 	<ul style="list-style-type: none"> Two BIPOC members are co-leading upgrades to an electronic tool by introducing select antiracist terms to it. We secured ethics approval to diversify our approach to participant retention.
9. Advocate for racially diverse leadership in science.	<ul style="list-style-type: none"> Intentionally empower BIPOC members with advancement opportunities within sponsored projects for their scientific career development. 	<ul style="list-style-type: none"> Four BIPOC team members were nominated for scholarships, college-wide awards, or formally listed on grant applications. One lab member created an opportunity for two BIPOC members to earn coauthorship for their contributions to intramurally funded dissertation research.
10. Hold the powerful accountable, and don't expect gratitude.	<ul style="list-style-type: none"> Require each lab member to have a goal and assigned readings on authentic allyship in their mentorship agreement. 	<ul style="list-style-type: none"> Create protocol for acting as a bystander in our lab handbook. We require each member to complete a "CPERL 101" training and to establish a goal in their mentorship agreements related to building antiracist skills. We successfully appealed decisions from two of three peer-reviewed processes, due to concerns with implicit bias in the review of our work.

Future Directions and Next Steps

CPERL celebrates its first decade this year. We take pride in what we have undertaken and achieved. We experience humility when we fall short in creating opportunities. We embrace our resolve to find the teachable moment and the allyship needed to convert failures into successes, while embracing the need to languish that is inevitably baked into this path of failing forward.

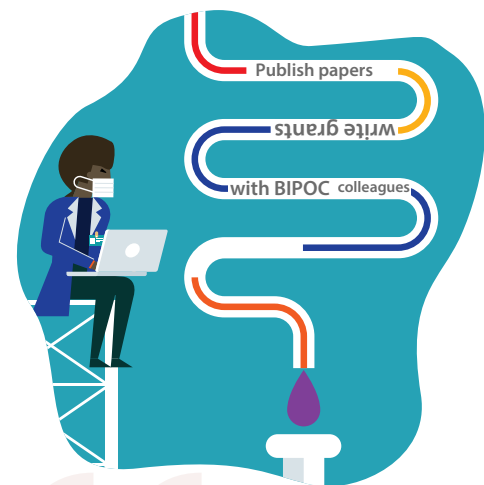
This next year, we agree to prioritize three actions to advance our plan: 1) integrating CC into our routine workflow (e.g., in journal clubs, manuscripts we write and are invited to review, and debriefings about candidate interviews); 2) diversifying and sponsoring team members to innovate and expand on how we deliver on sponsored projects (e.g., coproducing an article and podcast of our work for dissemination nationally; or carefully adapting a funded research agenda to reward high-performing lab members with credited training and capstone project opportunities aligned with their interests); and 3) seeking authentic allies to codesign new pipelines for lab member recruitment and retention, in light of gatekeeping practices that limit our reach.

We disseminate our plans and progress in the hopes that other research labs will follow suit, so as to create a network of labs producing JEDIs across academic institutions (i.e., Just, Equitable, Diverse, and Inclusive members of academic research labs; Peek et al., 2021). These JEDIs will have habits for fostering inclusive science to sustain the trajectories of aspiring but less-privileged scientists and research-engaged clinicians. To further emphasize this goal, we conclude this article with a preview of how two women in rehabilitation science are building their own

antiracist academic research labs and serving as role models in this endeavor:

Jessica Jarvis: Two months ago, I started my first faculty position at the University of Pittsburgh. It is a thrilling and terrifying privilege to take this next step from trainee to lab director. When considering the myriad factors involved in growing a successful program of research in academic medicine, it is easy to think I don't have time for anything "extra." However, it is undeniably clear to me that: (1) racism is a pervasive problem in our society and in our science; (2) DEI elevates the quality and impact of our work; and (3) antiracism has to start with me because inaction makes me part of the problem. I spent the last year uneducating and reeducating myself, having tough conversations with friends and family and examining and changing my own behaviors (e.g., not tone-policing my BIPOC spouse). I commit, alongside CPERL, to three actions as I prepare to launch my lab and onboard my first students: 1) include training resources on authentic allyship and bystander intervention in lab onboarding materials; 2) integrate CC into our routine workflow (e.g., in lab meetings and journal clubs); and 3) be explicit about lab values during student recruitment, to populate for an inclusive lab environment.

Michelle Phoenix: At the Speech-Language Pathology program at McMaster University's School of Rehabilitation Science, we created a lab values statement to convey how we choose to work together (e.g., in our willingness to offer feedback to help others achieve their goals; in our openness to requesting feedback and new opportunities; and in our commitment to honoring trust and confidentiality). To enact these values, we have started discussions at lab



It is undeniably clear to me that: (1) racism is a pervasive problem in our society and in our science; (2) DEI elevates the quality and impact of our work; and (3) antiracism has to start with me because inaction makes me part of the problem.

meetings to inform our individual and collective work as an antiracist lab. One discussion focused on an article and presentation by Chaudhary and Berhe (2020) and on a CPERL exemplar (Villegas et al., 2020). These resources sparked a conversation about each person's specific role, commitment, and actions in building our antiracist lab. One collective action step we then took was to create a check-in and sharing space at our lab meetings, where members can celebrate members'

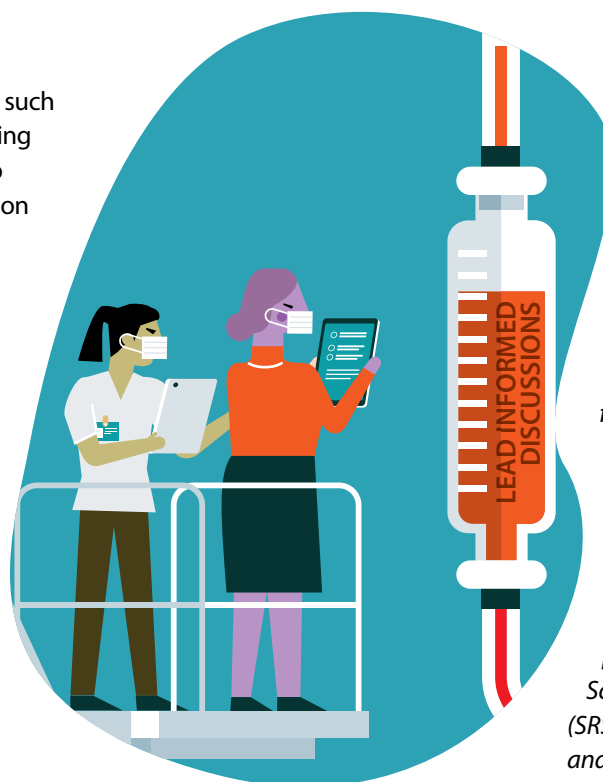
awis members in action

antiracist research progress

successes and address hardships, such as any discriminatory or challenging experiences, which will help us to establish habits for critical reflection on our antiracist practices over time. At one meeting, students requested that this check-in space be used to discuss our response to the discovery of mass unmarked graves of First Nations people at residential schools in Canada. As child and family focused researchers interested in structurally vulnerable populations, we processed the information and our emotions, discussed how we could embrace Indigenous people's perspectives (e.g., by viewing Indigenous poetry/art), and determined how we could commit to action. One idea was for individuals to read the [Truth and Reconciliation Commission of Canada: Calls to Action](#) report (Truth and Reconciliation Commission of Canada, 2012) and to choose an area where individuals were motivated and positioned to make change (e.g., in child welfare, education, and health). 🍓

Vivian Villegas, OTD, OTR/L is a pediatric occupational therapist. She is a BIPOC research specialist at the Children's Participation in Environment Research Lab (CPERL) at the University of Illinois Chicago (UIC) (<https://cperl.ahs.uic.edu>). Her work aims to create clear, accessible, and compelling information for caregivers as they navigate electronic participation-focused tools to codesign their children's services.

Zurisadai (Zuri) Salgado, BS is a first-generation Mexican American student entering the MS in occupational therapy program at UIC. She is a research assistant at CPERL, where she helps to



upgrade the functionality and use of electronic participation-focused tools for service providers and minoritized families of young children with developmental needs.

Julia Sim is an Asian American, honors undergraduate student majoring in psychology at UIC. She is a research assistant at CPERL, working on a capstone project on parent perspectives of the strengths and barriers to using an electronic assessment to share their expertise when designing their child's early intervention services.

Vera Kaelin, MSc, OT is an occupational therapist and PhD candidate in rehabilitation sciences at UIC. She identifies as a first-generation, non-BIPOC member of CPERL. Her dissertation focuses on personalizing electronic assessments and interventions for caregiver use when codesigning solutions to promote participation of children with disabilities.

Jessica Jarvis, PhD, MT-BC

is an Assistant Professor in the Department of Physical Medicine and Rehabilitation at the University of Pittsburgh and a CPERL alumnus. She is a music therapist and rehabilitation scientist conducting health-services research to understand and improve functional outcomes for pediatric critical illness survivors and their families.

Michelle Phoenix, PhD, CASLPO

is an Assistant Professor in the Speech-Language Pathology program at McMaster University's School of Rehabilitation Science (SRS). She directs MacCARES: Child and Families Accessing Rehabilitation and Engaging in Services, a program conducting research on access and equity in pediatric rehabilitation services. Dr. Phoenix is also co-chair of the SRS Anti-Bias, Anti-Racism, Anti-Oppression committee.

Mary Khetani, ScD, OTR/L is a pediatric occupational therapist and a rehabilitation scientist. She is a tenured Associate Professor and BIPOC faculty member in the College of Applied Health Sciences at UIC. She directs CPERL, a lab that conducts interdisciplinary and multisite translational research to advance family-centered and participation-focused pediatric rehabilitation with diverse populations and rehabilitation-relevant service contexts. Dr. Khetani serves as past president for the AWIS Chicago Chapter and is a member of AWIS's national Chapters and Affiliates and Scholarship committees.

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A Forensic Scientist's Path: What a Long, Rewarding Trip It's Been

By Rebecca (Becki) Learned, Forensic Scientist I, Firearms Unit, Mesa Forensic Services
AWIS member since 2020

From Midwest to East Coast to Southwest

My journey to becoming a forensic scientist has been a long but valuable one. It started in the Midwest, where I worked full-time as a legal secretary while pursuing a graduate degree in forensic science. I was fortunate to have a job that was flexible enough to allow me to take time off as needed in order to complete my studies.

After graduation I stayed in the Midwest for a while, honing my skills as a crime scene technician. For eight and a half years, I worked various shifts on a rotating, days on/days off schedule—and regularly encountered the aftermath of the violence people can do to each other.

One of the most amazing opportunities of my career then came in 2017: I was selected to participate in the National Firearms Examiner Academy (NFEA), a year-long program through the Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF) that provides academic and laboratory training in all aspects of becoming a practicing firearm and tool mark examiner. My class included ten other people from laboratories and agencies all over the United States, although I was one of



Photo credit: Rebecca Learned

Rebecca at an outdoor shooting range test firing a rifle, one aspect of her job duties.

only three women in this competitive program. The heavy workload and requirements included spending more than four months on the East Coast, immersed in hands-on training. But completing this program was worth all the challenges. Participating in the NFEA not only gave me the skills and knowledge to do what I do

now, but it also introduced me to other forensic scientists from across the country, whose backgrounds, relevant knowledge, and experience have proved invaluable to my own development as a forensic scientist.

In 2018 I moved to Mesa, Arizona, in the southwestern United States to begin my career as a forensic scientist with expertise in firearm and tool mark examinations. This career opportunity in the Firearms Unit of Mesa Forensic Services (MFS) was just too good to pass up, even though it meant leaving behind many family members and good friends. Moving more than a thousand miles away for a new job was exciting, as well as nerve-racking, but the transition was, thankfully, fairly smooth.

Harnessing Endurance

I consider myself to be very driven, ambitious, and self-disciplined. The word

endurance is also quite applicable to my career path. To me, endurance means being able to go the distance and to push yourself, no matter the obstacles—internal or external—that you may encounter.

Endurance also means understanding that slowing down while going

I am quite fortunate to work in a field dominated by women and hope that any young women interested in the forensic sciences may be encouraged by our prevalence in this career.

through a more difficult situation is not always a bad thing, and that slow progress is still progress, so long as you don't give up and you keep moving forward. I used endurance to get through all levels of my education, even when the work became complicated or my plate seemed full. I earned a bachelor's degree in four years while completing three majors, and I earned a master's degree in two years while working a full-time job.

I am also a long distance runner and have completed over a dozen half marathons, two full marathons (with a third coming in October of this year), one ultramarathon (a 50km trail race), and many other shorter distance races. The determination, dedication, and endurance I need to get through all of these races, and all of the training leading up to these competitions, easily mirror how I operate in my professional life.

Getting Others into the Field

Currently, I am the only woman firearms examiner in the Firearms Unit of the MFS laboratory, and I am proud of serving in this singular role. Overall, MFS is predominantly staffed by women, whose varied expertise includes biology, toxicology, controlled substances,

latent fingerprint analysis, evidence processing, and crime scene processing. I am grateful to have men as coworkers who treat me as a valued equal and with respect. At the same time, I am quite fortunate to work in a field dominated by women and hope that any young women interested in the forensic sciences may be encouraged by our prevalence in this career.

Is it as glamorous and fast-paced as some of the fictional TV crime shows portray it to be? No. It can be tedious, messy, sometimes smelly, and there are always plenty of reports to write. But at its core, being a forensic scientist involves the search for truth about a crime, whether that means helping to catch a criminal or helping to eliminate an innocent person as a suspect. I thoroughly enjoy what I do and will happily discuss forensic science with anyone who wants to know what it's like to be a practitioner.

Although I am still somewhat new to this career, I hope to become a valuable member of my lab by not only keeping up with casework, but also by passing on my knowledge to new firearm examiners. As my career progresses, I aspire to be the type of leader whose actions demonstrate

the core values of a forensic scientist: being ethical, reliable, and a producer of consistent, high-quality work. ✨



Photo credit: Mesa Forensic Services

Rebecca (Becki) Learned is a forensic scientist specializing in firearm and tool mark examinations. She has a strong background in the forensic sciences as a result of earning her Master's of Forensic Science degree, as well as through her prior work as a crime scene technician. She utilizes chemistry, physics, mathematics, and microscopy to perform the various duties related to firearm and tool mark examinations.

A Latina's Mission to Diversify STEM

By Elizabeth Munguia Trujillo, PhD Candidate

San Diego State University and University of California San Diego

AWIS member since 2021



To this day, I vividly remember a seminal moment as a middle schooler, sitting in the physical sciences building at the University of California Irvine during a Mathematics Engineering Science Achievement (MESA) competition. As I looked around the auditorium in awe, counting the rows and seats, I made a promise to myself: “Someday I’m going to be a student here, and I’m going to sit in this exact spot.” I was a very ambitious teenager, and I had only just learned what college was, and that it might be a path for me, the year before.

A few short years later, I had achieved my initial goal. But being a first-generation Latina college student from an underprivileged community came with its challenges. During my first year at UC Irvine, I began to understand some of the disparities students like me face in education. The high school I had attended did not have sophisticated lab equipment, nor did it have a first-rate science curriculum. My lab partners had a good comprehension of the structure of our experiments, and they were already familiar with the lab equipment, because of their rigorous high school curricula and the

extensive resources available to them. I soon realized that I had a great deal of catching up to do, not only in my science labs, but in my other courses as well. I increasingly felt out of place and struggled with my course load, which led me to question whether I even belonged in higher education.

It was not until years later that I heard others describe the feelings of self-doubt I had harbored as *imposter syndrome*. I think that at some point, most scientists experience a version of these feelings, but mine came very early on. I was still trying to figure out how to “adult in life” and

find my place in this world. It was a very discouraging time for me, but it later became my driving force to excel.

I had to wait six years after graduating from UC Irvine to apply to graduate school. Although I had enjoyed my undergraduate research project—studying voltage-gated potassium channels and their role in temporarily restoring consciousness during anesthesia—I had to take some time off of my educational path to work. I initially was hired by a nonprofit program called Anaheim Achieves, an after-school program that provides academic enrichment and sports activities to middle school and high school students, before getting the opportunity to serve as a research assistant at California State University Long Beach. At CSULB, I helped Dr. Leslie Reese with a project to research the literacy development and academic performance of Latinx children. While working for Dr. Reese, I took extra courses and eventually earned a second bachelor's degree in chemistry. Chemistry had been my weakness as an undergrad, and when I confronted that weakness head on, I gained a new sense of confidence in my own academic prowess.

Finally I began graduate school at Cal Poly Pomona, where I studied how Huntington's disease affects skeletal muscle function, working in Dr. Robert Talmadge's lab. My new project was completely different from my undergraduate research, and its novelty presented both new challenges and new opportunities for growth.

The focus of the research neatly aligned with what I was doing outside of the lab. Four years prior to starting graduate school I had begun to practice judo and Brazilian jiu-jitsu. Understanding how the body moves, how joints can be manipulated, and how to use leverage and technique over strength was exhilarating and empowering. This sport instilled in me a desire to know more about how muscles function and about what happens when they do not develop correctly.

Currently, I am a newly qualified candidate in the Cell and Molecular Biology joint doctoral program of San Diego State University and the University of California San Diego.

It is so important for women scientists, especially Latina scientists, to talk to underserved and marginalized students and to inspire them to dream big.

I have joined Dr. Richard Cripps's lab to study muscle development and how genetic mutations affect the fate of muscle fiber types. Generally, humans have two major types of muscle fibers, Type 1 and Type 2, and there are certain muscle diseases that affect one type more than another. My dissertation aims to uncover novel transcription factors that control the fate of muscle fiber types by studying the *Drosophila melanogaster* fruit fly. My career goal is to take my knowledge about muscle development and muscle diseases to companies doing biomedical research, working as a scientist to discover and develop life-changing therapies to reverse muscle wasting.

I also plan to continue mentoring and participating in the Society for the Advancement of Chicana/Native

Americans in Science (SACNAS), working primarily with underrepresented communities much like the one I grew up in. As I look back, I realize that I would not have dreamed of the possibility of attending college or of becoming a scientist if it were not for programs like MESA and SACNAS and the mentors who guided me along the way. I want to continue this legacy and to engage young scientists in middle school and high school who are fascinated by STEM. It is so important for women scientists, especially Latina scientists, to talk to underserved and marginalized students and to inspire them to dream big. One of the things I love about science is that it not only impacts my life, but it also has the power to impact the lives of so many people, both personally and globally. This ability to make a difference is what drives me forward every day. ✨



Photo credit: TKP Photo

Elizabeth Munguia Trujillo is a PhD candidate and Grad Student Co-Representative in the Cell and Molecular Biology joint doctoral program of San Diego State University (SDSU) and the University of California San Diego. She is studying muscle development and muscle fiber type fate. She loves being a wife and dog-mom and volunteering her time for outreach events through SACNAS at SDSU.

e-jə-'kā-shən

Dr. Njwen Anyangwe

AWIS Member since 2012

What is your favorite word?

Education

How do you define your favorite word?

Education is the life-long acquisition of knowledge, skills, ethical values, moral values, and hobbies, and applying them for self-improvement, societal benefit, and economic gains. In my opinion, the ultimate goal of education is to become a better citizen. Education also means imparting the knowledge, skills, and values you've gained to others.

What do you consider to be your most important career achievement?

Earning my PhD degree! My PhD degree served as a springboard for me to secure a job as a regulatory toxicologist with the U.S. Food and Drug Administration, and as an adjunct professor at Howard University. Without it, I do not think these careers would have been possible.

Describe an amazing opportunity in your STEM career.

I was awarded a Bio-Institute minority fellowship in 2007 during my postdoc. I attended workshops and seminars at Harvard University, Genzyme, and the Whitehead Institute, where I was exposed to a wide variety of non-academic career paths for PhD scientists. My awareness of these diverse science career paths for PhD scientists, generated through this amazing opportunity, guided my career decision-making process.

What challenge have you encountered throughout your career and how did you address it?

Being an African immigrant woman scientist in the U.S., I have faced a few challenges: exclusion, misattribution of my ideas, and lack of recognition for my contributions. I am assertive and I address these challenges by having an honest conversation with the parties involved.

How has being part of AWIS impacted your career journey?

I have benefitted from the many resources for professional development that AWIS offers. In addition, AWIS has a huge network of powerful women scientists who serve as role models and excellent resources for professional growth.



What are you currently reading or listening to?

I am currently reading two books: the first is *When Hope Enters*, a book filled with stories of love, redemption, and hope from all across the world. The second is *The Code Breaker: Jennifer Doudna, Gene Editing, and the Future of the Human Race*.

What is the most important leadership lesson you've learned?

The most important leadership lesson I have learned is the importance of including diverse opinions in the decision-making process. Harnessing the power of diverse perspectives is profitable to the organization and it goes a long way in building harmony and trust within the team.

What do you consider the best professional or personal advice you've ever received?

Don't ever quit! When you fail, analyze the problem, take responsibility, make corrections, and remember that each failure is a learning experience that will bring you closer to success. ✨

Dr. Njwen Anyangwe is an adjunct professor at Howard University in Washington, DC, where she teaches nutritional biochemistry courses to graduate students in the Department of Nutritional Sciences. She is also a regulatory toxicologist with the U.S. Food and Drug Administration (FDA). Dr. Anyangwe is a multidisciplinary scientist with education, training, and experience in biochemistry, cancer biology, molecular biology, nutrition, and regulatory toxicology. Her personal interests include cancer prevention, health promotion, mentoring young girls, career development of young scientists, and women's and girls' empowerment.



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